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FEBRUARY 1972 THE NAVAL AVIATION SAFETY REVIEW

606

Is the Aircraft REALLY Ready for Flight?

LCDR J.F. Hill (Adapted from Approach, May 1968) illus 1-4

MECHANICAL, electrical or hydraulic equipment – unlike the human body – have no recuperative power. Therefore, when an equipment malfunction occurs, we must correct the discrepancy. If we do not, the trouble will persist and more than likely worsen.

This is why we must be very suspicious of the phrase, "Ground checks OK," when it is used to write off an aircraft discrepancy. The truth is, if a discrepancy really existed in the first place, there is a 99 percent chance that the discrepancy still exists, notwithstanding the fact that the equipment "ground checks OK." In most cases, it would be more forthright to state simply that, "The trouble cannot be identified because the discrepancy cannot be duplicated on the ground."

If the problem cannot be identified, what can be done? Or more correctly, what should be done? The very first thing which must be done is for all concerned to recognize that the aircraft has an *uncorrected* discrepancy. Once this has been done, attention can be directed to determining what action must be taken.

An attempt should be made to correct the problem, of course. This entails troubleshooting. It's relatively simple to troubleshoot most discrepancies but maddening to troubleshoot some. If a light bulb fails to illuminate when the switch is turned on, troubleshooting procedures would include replacing the bulb. If the light then illuminated, the troubleshooter would be justified in believing he had corrected the discrepancy.

On the other hand, the troubleshooter must be leary of some troubleshooting procedures. Sometimes a pilot will gripe a piece of equipment but it ground checks OK. Maintenance personnel – not satisfied to write the matter off as "ground checks OK" – may also replace the component involved. This shows concern and interest but it does not prove very much. That is, if the old component ground checked OK, it is a forgone conclusion that the new component will also. Therefore, unless logical and *tested* troubleshooting procedures are used, and the mech *knows* he has isolated and corrected the problem, he should plainly say so in the writeoff. He should indicate that the corrective action taken was speculative in nature and that further checks are necessary to determine whether the problem has been corrected.

Many checks of this nature can be made in the course of the next scheduled flight but some cannot, or at least should not. It depends primarily upon the nature of the discrepancy, but consideration should also be given to the persistency of the problem.

It, therefore, becomes part of the larger question of whether the aircraft is up, up for test, or down. This is a

question which must be answered thousands of times daily in naval aviation. Ideally, there is only one answer – the correct one. In reality, the correct answer eludes us in far too many cases. This is unfortunate because many accident reports on file at the Naval Safety Center show that we cannot afford wrong answers (see box at end of article).

Coming Up With the Correct Answer

Most of the time the answer is simple and clearcut: an aircraft has a discrepancy which does not meet established criteria for flight; therefore, it is *down*. In this connection we have a large body of established criteria regarding the airworthiness of aircraft. It is the result of our best efforts in the area of design, engineering, manufacturing – and operational experience. Much of the criteria leaves little room for misinterpretation, e.g., when an aircraft engine has X number of operating hours, it must be overhauled.

Other criteria are less positively established. Nevertheless, it is usually sufficient to provide effective guidance to knowledgeable maintenance and operating personnel. What then is the problem?

First, as we have already indicated, the existence of the problem may not be adequately recognized or, if it is, the solution is not apparent. Moreover, at times there is an honest difference of opinion as to the weight which ought to be accorded specific discrepancies. Finally, we often have to take operational commitments into consideration.

Recognizing the Problem

There are many individuals who tend to hedge when it comes to measuring the aircraft against the established criteria. The pilot who circles the *up* arrow on the yellow sheet and then writes: "For pilot info: slightly dragging left brake," may be performing a correct and highly desirable function . . . keeping everyone informed of the condition of the aircraft . . . or, he may be merely passing the buck via a "good guy's" writeup. In any

event, the pilot is probably in the best position in this case to assess the extent of the problem. But if he defaults in this duty, who will pick up the ball and run?

The point is, the impact of what often should be a blunt and forthright statement, i.e., "The aircraft is *down* – left brake drags," is hedged at times by a pilot info note. We ought to mention, too, certain adjectives which are frequently found on yellow sheets: "Small, minor, insignificant," etc. We don't say such words should not be used; they often *must* be used to indicate more exactly the degree of the problem. However, many of these words have a permissive implication and are sometimes employed for just that reason.

Most aircraft systems include gages, dials and indicators of one type or another which, if not ignored, will give some good indications of system malfunctions. Be that as it may, assessing the condition of an aircraft system often requires an expert knowledge of mechanics, superior airborne judgment, and the moral courage to tell it like it is – on the yellow sheet.

If a pilot does not possess the requisite mechanical knowledge – and many don't (considering the complexity of today's aircraft) – it is incumbent upon the pilot to consult with experienced maintenance personnel in order to ensure an effective writeup. Maintenance personnel also have an equal responsibility to report aircraft discrepancies, whether it be a plane captain who notes a questionable condition on a daily preflight, an experienced mech who notes a problem during a periodic check, or a line midwatch who spots fluid leaking from the aircraft. All have a responsibility to insure discrepancies are fully reported and documented.

To summarize, correct decisions cannot be made on the *up* or *down* status of aircraft unless positive steps are taken to adequately identify discrepancies. One area where serious problems are often overlooked is in the case of *repeat gripes*. This subject is important enough to deserve separate comment.

Repeated Gripes – *A Red Flag*

Any item repeatedly griped on the yellow sheet should serve as a red flag warning. It matters not that it is a seemingly minor discrepancy. The fact is, it could not *really* be minor if repeated efforts of the maintenance department have been ineffective in eliminating it. Therefore, whenever the remedy cannot be established for a repeat gripe, large or small, take warning – it's a good indication that there is something seriously wrong, either in the aircraft, in the maintenance or operating personnel procedures, or in the maintenance system.

In these cases the status of the aircraft should become a continuing concern at the highest levels of maintenance department supervision. This does not necessarily mean that the aircraft should be arbitrarily *downed*, but in many cases it should be until all avenues of expert investigation and assistance have been exhausted. We refer now to the expertise available from the local AIMD, the manufacturer's representative, NARF, staff maintenance, and many other sources.

Many discrepancies are not susceptible to duplication on the ground, a fact which we have already discussed. This is sometimes a contributing factor in repeat gripes. In these cases an additional flight or flights may be necessary to more definitely identify the problem *and* the correct fix. The big hazard here is that the inflight check will be regarded as a minor requirement and will be assigned to a pilot as a routine collateral duty during the next scheduled mission. When in reality, because of the persistence of the problem, it should rightly be regarded as the primary reason for the next flight.

Utilizing regularly scheduled flights to make certain inflight checks for maintenance purposes is a valid procedure. It should be questioned, however, in the case of repeated gripes which have not been corrected through established maintenance procedures. It follows that if repeat gripes are properly recognized as a serious problem, it is also a matter serious enough to warrant the attention of a properly qualified maintenance test pilot, accompanied by experienced maintenance personnel, when appropriate. The point is, when an aircraft or aircraft system is repeatedly griped, for the same or similar reasons, it's trying to tell us something. *We ought to listen!*

Operational Requirements

This is another factor which often figures into the *up* or *down* status of an aircraft. Our problem is to ensure that it is figured correctly. There are times when a pressing operational need will dictate launching an aircraft with known discrepancies when it would otherwise qualify for a *down* status. This is a perfectly valid concept; however, such decisions must be made at a responsible (and authoritative) level, based on the best information available. Such decisions should never be

the mere result of default in reporting or assessing discrepancies.

From time-to-time the tempo of operations may pick up as a result of operational requirements. Almost invariably personnel assigned to the unit will be caught up in the spirit of the general upswing and will tend to manifest the traditional "can-do" attitude. This is fine, but it does create a potential hazard. A pilot or maintenance man, in the spirit of expediting operations, may discount or ignore seemingly minor discrepancies without subjecting them to adequate processing in the established system. Such an instance might be failure to gripe a navigation aid because the next flight will be made in VFR conditions. This can only short-circuit the decision-making process.

Soul Searching in Order

The decision-making process by which we answer the question, is the aircraft *up* or *down*, is complex. We don't presume to know all the answers as to how this process should operate. It is apparent, however, that this decision-making process should be the subject of soul-searching and continuing review at the operating level. If it is to be an effective process, it must include:

- Pilots and maintenance men who tell it like it is on the yellow sheet and other aircraft records.
- Respect for established criteria. Granted, certain criteria may be subject to change depending on operational requirements. This does not mean, however, that the criteria can be ignored. Rather, it means that when operational requirements dictate less stringent criteria, it becomes all the more important that such criteria be fully respected.
- A positive approach to the identification, reporting, assessment, and correction of aircraft discrepancies, especially those of the repeat or "ground checks OK" variety.
- Recognition that honest differences of opinion do exist concerning aircraft discrepancies. In this connection, unit leadership and sound supervision should provide positive safeguards to ensure that maximum knowledge, experience and judgment is brought to bear on the problem. If this means bucking the problem all the way to the maintenance officer or CO – then, so be it!

Is the aircraft *really* ready for flight? This is a question which demands the best judgment of pilots, maintenance crews and operations personnel. Overlooking, ignoring, or merely tolerating aircraft discrepancies, will not meet this demand.

Adapted from the article, "Up or Down"
by LCDR J. F. Hill
APPROACH, May 1969

From

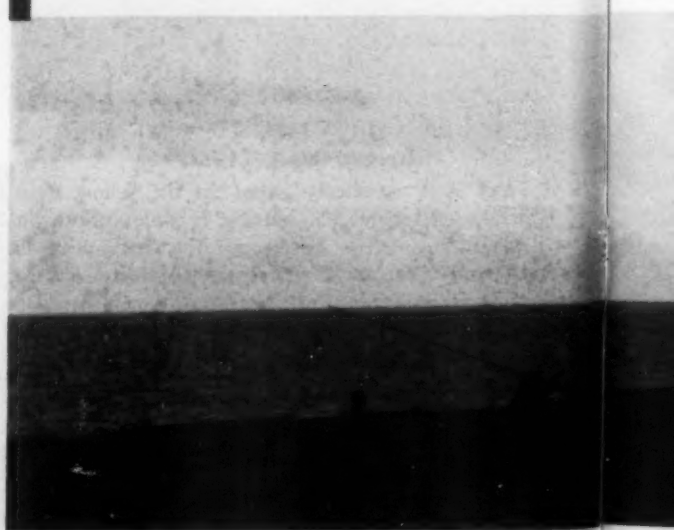
- *The accident:* The aircraft departed on a cross-country flight under actual instrument conditions. The pilot acknowledged a radar vector to a new heading. Communications were lost. The aircraft subsequently crashed. Alfa damage/fatal injury.

Investigation results: It was determined that the aircraft had a history of attitude gyro problems as evidenced by repeated yellow sheet gripes during the preceding month. Records revealed five discrepancies, ranging from a 10-degree right-wing-down error to complete failure. In all cases the maintenance department had been unable to duplicate the malfunction on the ground.

- *The accident:* The aircraft experienced a complete electrical failure while on an IFR cross-country flight. The EPP (Emergency Power Package) would not extend. The aircraft subsequently crashed. Alfa damage/major injury.

Investigation results: It was determined that the aircraft had a past history of electrical failures. Previous failures had been in the main electrical system and in the EPP operation and extension.

- *The accident:* During climbout the student



NAVSAFECEN Files

reported odors in the cockpit, then smoke, then flames. The aircraft subsequently crashed. Alfa damage/fatal and major injury.

Investigation results: On the previous flight the aircraft had been griped for a strong burning smell in the cockpit. Corrective action was: "Pulled visual inspection on the engine and accessory section; airframes conducted their inspection; aircraft was turned up; request maintenance test hop."

- *The accident.* The pilot experienced inflight control failure and got a fire warning light. The aircraft subsequently crashed. Alfa damage/no injury.

Investigation results: It was determined that since installation the engine had a history of seemingly uncorrectible, EGT, RPM and fuel flow discrepancies. Other, less repetitious discrepancies included fumes in the cockpit and engine overspeed conditions. The EGT was recorded on eight different flights during the preceding 2 months as being too low. Three instances of fluctuating EGT, RPM, and fuel flow were also reported. On five separate occasions, including the final flight, fumes in the cockpit were reported.

- *The accident:* The pilot filed for an extended cross-country flight under IFR conditions, with several enroute refueling stops and a passenger stop. Shortly after takeoff on the first leg, the attitude gyro failed in both cockpits. After dropping off the passenger at the second stop, the pilot departed on another leg of the flight. He subsequently crashed while executing an instrument departure in actual instrument conditions. Alfa damage/fatal injury.

Investigation results: The passenger (on the first two legs of the flight) stated that the pilot's reaction to the failed attitude gyro, experienced after the first takeoff, was one of little concern . . . he stated that "the weather is forecast to remain VFR for the weekend." The passenger further stated that the attitude gyro had not functioned properly at any time after its initial failure.

There are many other reports on file at NAVSAFECEN of a similar nature. In most of the accidents recounted here it is apparent that the aircraft should never have been certified for flight. Could it happen in your unit?

Short Snorts

If you can't stay on a diet, do the next best thing. Stay off scales.

Ace L.

Hurry, Hurry

AN E-2B *Hawkeye* was being towed from the hangar to the ramp for a low power turnup. It was towed past, and swung 180 degrees to a parking spot directly behind a TE-2A. The tow bar was then unhitched from the tow tractor *before* the *Hawkeye* was chocked. Unfortunately, the ramp in this area sloped toward the TE-2A, a fact unnoticed by the plane handlers until the E-2B began to roll.

Seeing the "Hummer" start to roll, the tractor driver quickly drove the tractor clear in order to avoid a collision. Meanwhile, the brake rider in the cockpit applied the toe brakes but they were ineffective because the brake selector valve was in the *normal* position. *No attempt was made to use the emergency brake.* The E-2B continued to roll until it collided with the tail section of the TE-2A, causing minor damage to both aircraft.

Only three men had helped tow the aircraft from hangar to ramp – a tractor driver, one wing walker, and a man in the cockpit – instead of the five men normally required. Missing were a plane director and an additional wing walker. The tow team did not include a qualified plane captain even though there were two qualified plane captains in the barracks on call. In addition, the man in the cockpit lacked experience or knowledge of the braking system.

The commanding officer cited the tempo of operations as a contributing factor in this incident. He noted a portion of the squadron personnel were at sea for an ORI, and the remainder standing by at the NAS to provide quick turnaround maintenance as needed. The personnel involved in this incident were in such a hurry to get the aircraft ready to return to sea that they failed to follow established safety precautions.

The interest of personnel in getting the job done is commendable; however, we must guard against unwarranted shortcuts. There is *seldom any requirement* which justifies the omission of established safety precautions.

A Substitute Isn't Always Acceptable

HOW many test flights are necessary to get an aircraft in an UP status after an engine change? Suppose it isn't the correct engine?

In this incident, the aircraft was on the third test flight after installation of a new engine. Approximately 15 minutes after takeoff the auxiliary hydraulic pump failed and a precautionary landing was made on the ramp. This also was the third hydraulic pump failure since the new engine had been installed. Three test flights of .2, .3, and .2 hours and three

hydraulic pump failures was enough to cause some scurrying around.

The station had been operating UH-34Js which use the R1820-84D powerplant, but the replacement aircraft was a UH-34D which uses the R1820-84C engine. The UH-34D required an engine change, and sure enough an R1820-84D was installed by error. Maintenance submitted a requisition for a R1820-84C but a fine broth of a man in the storekeeper business, who knew an R1820-84D was in stock, assumed an error in the requisition stub and issued the engine he had on hand. Type Equipment Code (Appendix P, Volume III, OPNAVINST 4790.2) approves the R1820-84D as an acceptable substitute for the UH-34D. The maintenance folks noted the -84D engine but didn't question the substitution. The hydraulic pumps were mounted on the -84D at the 11 o'clock position even though the drive adapter was found in the 6 o'clock mounting pad position and had to be removed.

It was finally all straightened out after various HMIs, R1820 Powerplant Bulletins and OPNAVINST 4790.2 were consulted. As a result of this research, a recommendation was made to change various sections of the Equipment Application Codes in OPNAVINST 4790.2 and the HMI to preclude substituting the engines.

If there is a moral to this story, it might be that any time a substitute part is approved, insure that it's the correct one! A modification required to the existing plumbing or accessories is certainly the tipoff to check further.

No One At Home

LATE one night, about 2300, a member of the duty section aboard an air station was sent to the helicopter line to secure four aircraft. He rotated the blades of one helo to tie them down and inadvertently cracked a retention assembly and bent the tracking arm of the actuator assembly.

What he did not know was that the aircraft had not been properly secured at completion of flight operations (hours before); that the rotor blades couldn't be rotated under certain circumstances; and that a damper had been removed and the aircraft not tagged.

Helicopters were fairly new to this air station and were being used to maintain a heavy training schedule – ground and flight. However, it is inexcusable that directives requiring tiedowns and aircraft security on the line were not followed and that an aircraft with parts removed was not so tagged. *Holee simolee!* It kind of makes you wonder what the plane captain, line chief, and operations officer were doing, doesn't it?

Safety Tip

RECENT inspections and surveys have disclosed recurring local shortages in aircraft equipment and personal safety/survival gear. Most of these shortages had not been properly reported. Flight operations, however, were continued in spite of known deficiencies. The decisions to operate under these conditions may have been unnecessary. Although COMNAVAIRLANT is responsible for logistic support of aviation activities within the Atlantic Fleet, assistance in overcoming critical local shortages is dependent on timely and proper reporting. Commanding officers are directed to insure adequate reporting of aircraft and aircrew equipment shortages under the provisions of COMNAVAIRLANTINST 4295.1B. ◄

COMNAVAIRLANT *Weekly Safety Bulletin*

Hushians, SST and Bugs

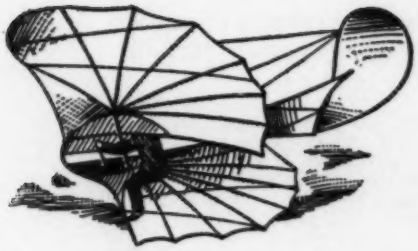
DURING the Revolutionary War, circa 1772, an elite group of mercenaries sold an idea to a certain general who was bossman of a bunch of raggedy Colonists. The mercenaries were a mixed bunch of "furriners" who, although they spoke in strange tongues, were way ahead of their time. The idea they proposed was a very hush-hush one and thus they became known as *Hushians.*

Their idea, appropriately enough a revolutionary one, was to quietly float troops, at night behind the enemy, and attack his rear at dawn. It just so happened that the time of year was late summer, and dawn began at 6 o'clock – thus the expression, "watch your six."

The *Hushians* demonstrated the feasibility of their plan by filling a balloon with hot air, which lifted a soldier and allowed him to sail downwind a mile or two – enough to get behind enemy troops (providing the wind was from the right direction). The only control the soldier had was a small valve which enabled him to release hot air from the balloon and descend when he reached the approximate area. When the valve was opened the escaping hot air sounded like *s-s-t, s-s-t*. So the secret project was called the SST project.

The *Hushians* received the go-ahead from the boss and withdrew from the front lines about 10 miles so that they might conduct a rigorous training program. The General had tasked them to have 200 soldiers trained and ready to go in a fortnight. There were, however, many problems. The *Hushians* had only two prototype balloons for training, and the manufacturer was unable to deliver any production models for months. The *Hushians* also discovered that after the prototypes had been used several times their shelf life expired and the balloons refused to stay inflated – *no matter what*. The material, which was supposed to contain the hot air, had a propensity for allowing the hot air to escape soon after the balloon was filled.

The manufacturer's reps were summoned to the test



site (a hard three-days' ride on horseback with no per diem).

During the final day of observations and conferences the senior rep, H.O. Tally, couldn't be found to give the okay for an important test. The other reps searched but couldn't find him and decided to conduct the test anyway. As the test was drawing to a close one rep hollered, "Anyone seen Tally yet?" As he spoke, the senior rep came out of the woods and hollered, "Tally, HO here."

After witnessing the operational problems, the reps announced they would have to return to the plant and redesign the balloons. Thus the first efforts of the SST program went *f-f-f-t*.

The war, of course, came to an end, with the good guys winning, but the SST program continued. Great-grandsons relieved grandsons who relieved sons of the developers of the prototypes. R&D activity continued at various speeds – fever pitch when there was money available and at a complete standstill when there wasn't any. Proud and undaunted, these hot air specialists kept trying to perfect operationally, what in theory seemed practical and fairly simple.

Their efforts were expanded from the single soldier concept to balloons which could hold several soldiers. Although new materials were developed, the state-of-the-art advanced slowly and somewhat less than surely. A major breakthrough took place when some forward thinker advanced the theory that gas, instead of hot air, would be a better lifting agent. The advantages of gas over hot air were manyfold.

Quite a few years later, when another shooting engagement began across the pond, large gas-filled observation balloons were used and proved to be advantageous. Troops were never packed in and allowed to sail behind enemy lines, as originally conceived, but other tactics were developed. During the next three decades other developments occurred to push the SST program along. In addition to gas in the bags, engines were slung to provide propulsion, and controls were added to aid in maneuvering. The world was awed as the giant dirigibles made their appearance.

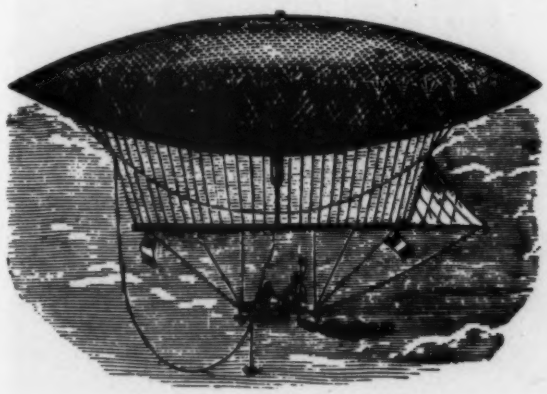
The demise of the lighter-than-air craft is attributed to a couple of tinkerers. They were bicycle mechs, brothers in fact, who worked for years and years on a real expensive idea that a machine with wings for support and a propeller for thrust was practical.

Another gent, after working in the fixed-wing program, *and doing nicely thank you*, turned his talents in a 360-degree direction to prove that the wings didn't have to be stationary. They could be rotated to support the machine and propel it too. Both of these earlybirds, *to coin a phrase*, lived to see tremendous strides in the development and production of newer and better flying machines.

Looking back on two centuries of effort it is easy to see where the balance of power could easily have swung one side or the other if theories had become reality in operations. However, during the operational phases problems would always arise, and these problems became known as bugs. Now you and I both know you can't live with bugs. People don't like them and become very impatient to get rid of them. Even the *Hushians* who started the SST project ran into them. For example, they found out that the soldiers who were supposed to sail under the balloons objected when the balloons deflated and, upon collapsing, practically smothered them.

The "crunchies" were also loud in their condemnation of the balloons even when they did stay inflated. They found that while aloft they could take no offensive or defensive action and were called passivists. How could they know that 200 years later this word would connote dirtybirds?

So we have learned that personnel problems were then, and are now, part and parcel of the bugs which have to be worked out of new models. With changes in concepts and new methods of eradication, bugs should disappear in the next 200 years. People won't sit still for bugs. Let us spray.



Here it is, gentlemen . . . that 10,000-pound, twin-turbine attack helicopter . . . that scourge of enemy troops . . . that sweetheart of friendly troops . . .

the AH-1J Seacobra.

illus 10-13

IT was just a few minutes past midnight in HDC (Helicopter Direction Center) – call sign *Luminous Base*. Several pilots were assembled to be briefed for an emergency MedEvac from a hot zone. Three of the pilots, all good friends, were Phillips, the section leader of the H-46s; Witsell, the section leader of the gunships; and McClain, the pilot of Witsell's wingship. Their call signs were Lady Ace ZERO FIVE, Kevin ONE FIVE and Kevin ZERO NINE.

As soon as the briefing ended they ran for their helicopters and within minutes were airborne.

Kevin 15: Luminous Base, Kevin 15 with three outbound on MedEvac Delta.

HDC: Roger.

Kevin 15: Lady Aces, Kevin 09, go working UHF and button red.

Kevin 09: 09 up.

Lady Ace 05: 05 and 10 up.

Ten minutes later the helicopters approached the area of activity.

Kevin 15: Blue Bonnet 3, Kevin 15 is inbound for your MedEvac.

Blue Bonnet 3: Kevin 15, roger. Zone brief follows: One emergency MedEvac, good three-plane zone, 360-degree perimeter of 50 meters, no friendlies

outside perimeter, heavy small arms fire from east about 300 meters, best avenue of approach is west, clear to fire outside of 50 meters from zone. Zone marked with strobe.

Kevin 15: Lady Ace 05 and Kevin 09, do you have a good copy?

Lady Ace 05: Roger.

Kevin 15: 09, set up left-hand orbit over zone. I'm rolling in on muzzle flashes.

Kevin 15: Lady Ace 05, advise when commencing approach.

Lady Ace 05: Roger. I'm starting approach now. Going lights out.

Kevin 15: Roger, Lady Ace. 09, I'm off cold.

Kevin 09: Roger. I'm rolling in hot.

Lady Ace 05: Kevin 15, I'm lifting. Departing west.

Kevin 15: Roger. 09, I'm off cold. Make another run.

Kevin 09: Rolling in hot.

Altogether the two gunships made six runs spewing hundreds of rounds of 20mm from their turrets and launching deadly rockets into the enemy position.

Blue Bonnet 3: Kevin 15, MedEvac completed. Thank you.

Kevin 15: Roger, anytime. 09 join up. Lady Ace 05, switch to Luminous Base.

Continued

Kevin 15: Luminous Base, MedEvac Delta completed. Do you have any pending MedEvacs?

HDC: Negative MedEvacs pending. Return to base.

The section of H-46s turned to a different heading to take their patient to the hospital. The *Seacobras* continued inbound to homeplate and landed. Another MedEvac mission had been successfully completed.

The mission recounted is typical of those flown by the owners and operators of the AH-1J, HMA-269, based at MCAS(H), New River, North Carolina.

The AH-1J is a tandem, two-place, twin-turbine helicopter manufactured by Bell Helicopter Co. Designed especially for combat, it's an exceptional, high-speed helicopter built to *ATTACK*! The bird is light and highly maneuverable, but very rugged. Its primary mission includes search, target acquisition, and reconnaissance by fire as well as fire support of troops and troop helicopters.

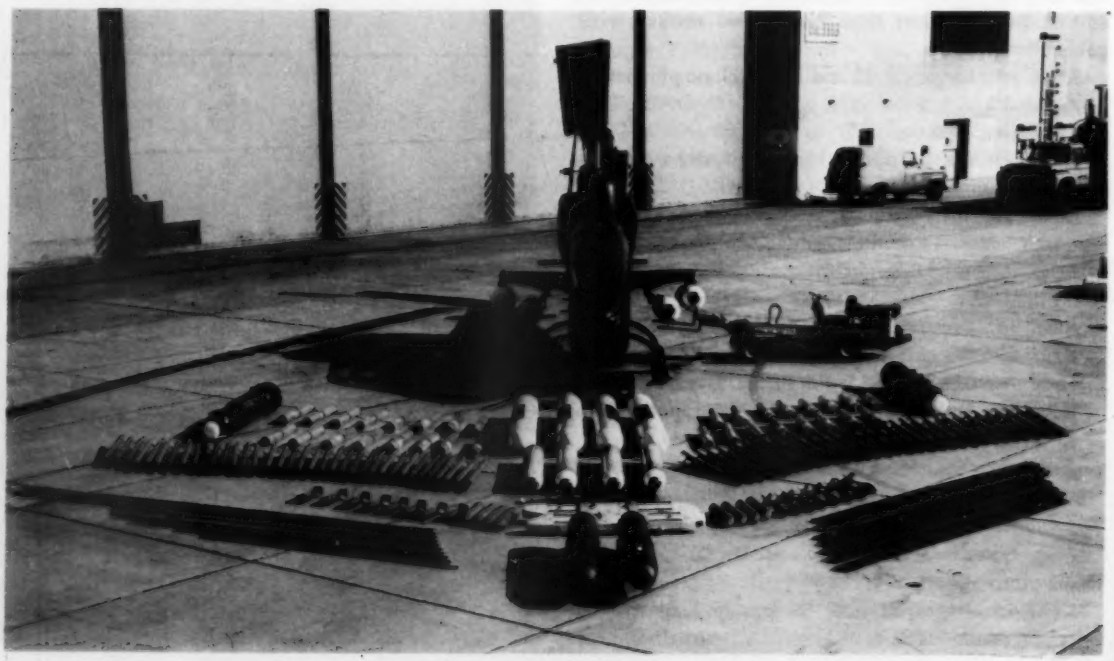
One of the distinguishing features of the *Seacobra* is the chin turret with the three-barrel 20mm guns which command the utmost respect. Stub wings provide support for the wing store pylons. A variety of bombs, rockets, flares, and smoke grenades can be carried – depending on mission requirements. A typical day load might include two 19-shot pods of 2.75 rockets with HE or HEAT heads, a pair of 7-shot 2.75 rockets with WP, and two launchers of smoke grenades.

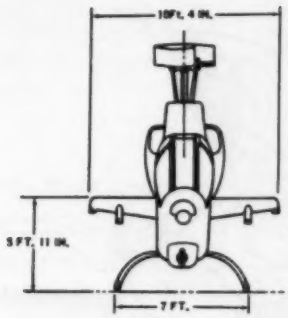
The powerplant is unique. There are two Pratt and Whitney turbines, T400-CP-400, driving a single output shaft of a common reduction gearbox. Each engine produces 900 SHP, but the aircraft is transmission restricted to 1600 SHP – so most of the time the engines are loafing. Except under the unusual condition of both max gross load and hot temperatures, either engine provides enough power to safely operate the *Seacobra.*

In a head-on view the AH-1J presents a small target. The pilot compartment is only 3-feet wide while the widest part of the helicopter, the stub wing, from tip-to-tip, is just 10 feet.

On the line, however, this helicopter needs plenty of room. With the main rotor blade secured in the usual fore-and-aft position, it stretches out over 53 feet. The tail rotor, *on the starboard side* of the tail boom, has approximately 5-feet clearance from the surface (4 feet 11.8-inches).

It is most important, particularly to you *old hands* familiar with the *Hueys*, to approach this bird from the front only. Don't let old habits (working around *Hueys* with the tail rotor on the port side) trap you now that the *Seacobra's* is on the opposite side. There is almost a 10-foot differential in clearance between the main rotor blade and the surface, depending on the position of the main rotor blades at rest. If the main rotor blades are secured in the normal fashion, rear blade tied down, there is over 17-feet clearance between the front blade and the surface. If the front blade is at rest, full-down, there is only 7 feet 11-inches of clearance between the blade and the surface.





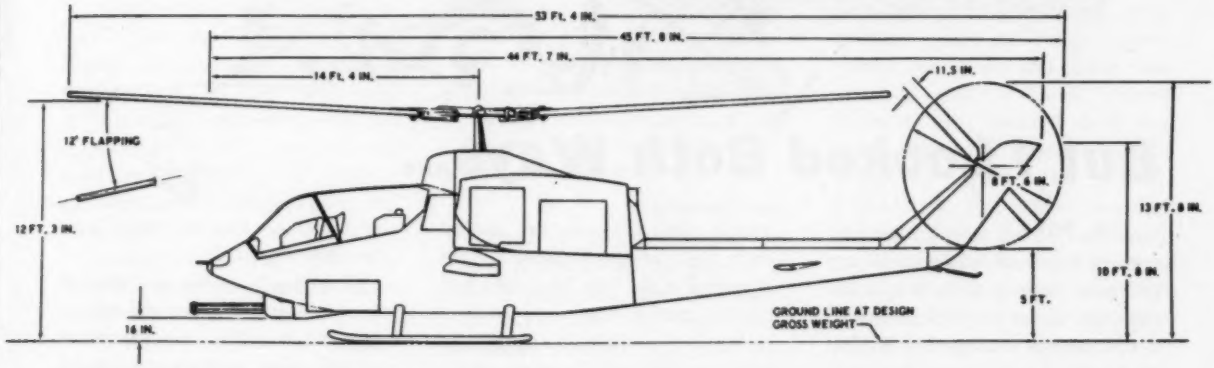
Attack Helicopter Mission

- Helicopter assault
- Riverine operations
- Armed escort

MedEvac

Reconnaissance patrol (insertion and extraction)

- Visual reconnaissance
- Close air support
- FAC(A) (Forward Air Control-Airborne)
- Artillery and naval gunfire spotting



The landing gear consists of two skid tubes and two arched cross-tubes of formed aluminum alloy. To prevent abrasion and damage from contact with the surface, replaceable steel skid shoes cover the bottom of the skid tubes. Although the AH-1J is built on skids it can be towed by attaching two ground handling gear assemblies.

Let's take a look at the operating aspects of this "jewel." Empty weight is about 6900 pounds. Normal fuel with an ordnance load is 1200-1500 pounds – good for 2½ hours of flight. Normal cruise is 140 KIAS. Dive speed with an ordnance load is in excess of 170 KIAS. Maximum airspeed is just under 200 KIAS.

The *Seacobra* is not the best equipped aircraft for cross-country flying. It has only a TACAN and ADF – no VOR receiver. Communication equipment is good. The plane has both the AN/ARC-51AX UHF and FM transceivers.

Certain system redundancies exist. The AH-1J has two similar but separate 1600 psi hydraulic systems. It has two 30-volt 200-ampere starter generators for d.c. power and two a.c. inverters.

Pilot comfort has not been overlooked. There is an ECU (Environmental Control Unit) which provides heat or air conditioning through the seat and back rest. Other help to the pilot in flying the bird, in addition to personal comfort, is provided by the SCAS (Stability and Control Augmentation System) which operates in the three-axis mode. There is also a rain removal system which uses bleed air to provide a clear windscreen during precipitation.

An innovation of great import in the powerplant is an integrated hydro-mechanical and electrical control system that provides steady-state power turbine speed at any preselected RPM. The control system automatically prevents overtemperature, overspeed of the gas generator turbine and power turbine, and compressor stall.

There is nothing quiet or passive about the AH-1J, and since it is designed to attack, it is not surprising to find a heavy emphasis on gun and rocket training flights. The noise that the *Seacobra* makes as it rolls in from the perch and begins accelerating in its dive, is deafening. The sharp, loud, ever-increasing in volume staccato "whap, whap" of the blades is frightening. However, this is "quiet" compared to the sound of rockets being fired in pairs and the roar of 20mm ammo being spit out at 750 rounds per minute.

The time is now. The action is at HMA-269 – the first AH-1J operational squadron. The order of the day is *ATTACK*. The *Seacobra*, just like its namesake, is a deadly, front-fanged "critter" – nothing but bad news for the enemy. ◄

Anymouse

But I Looked Both Ways...

THE TOWER watch supervisor noticed a pair of headlights on the perimeter taxiway along the parallel runways. Closer inspection revealed a tow tractor towing an F-4 from west to east across the dual runways. No prior coordination or clearance for this movement had been obtained.

Just prior to noticing the tractor, the tower had cleared a flight of two A-4s for a section takeoff on an IFR departure. The tow tractor was given a red light prior to its entering 33R (15L) but this signal went unnoticed and the tractor, with F-4 attached, started onto the runway in *front of the departing A-4s.* The *Skyhawks* had to take evasive action to prevent a collision. No injury or damage was reported, although the potential for this incident was four fatalities, three strike damage aircraft and one destroyed tow tractor.

The operations duty officer talked with the tractor driver after the incident. The driver reported that only the day before, he had delivered the same aircraft over the same route with no interference (also with no clearance or prior coordination). The driver also stated that he had never received any training or briefing on course rules for towing aircraft on the airport movement area.

This incident was in flagrant violation of Air Station Order (-), paragraph (-), Personnel and Vehicle Movement.

Towermouse

First off, an award for self-control should be presented to the operations duty officer if, as you say, he merely **talked** *to the tractor driver. Most ODO's would have had to be restrained from justifiable homicide!*

How much intelligence does it require to realize that **some sort** *of clearance should be obtained before crossing those wide-open concrete spaces – especially during a period of flight operations?*

Fingers can be pointed at a number of people here – from tower personnel who missed seeing him cross (both ways) the previous week, to the brake rider (on both trips), and especially the squadron who certified the tractor driver as qualified.

Orders written by air stations concerning vehicle movement on the airport are utterly useless unless units take the necessary action to insure that all line personnel are briefed and rebriefed on the procedures to be followed!

Ignorance of the law in this case could certainly have caused tragedy. No pilot likes to even **think** *of some tractor creeping out of the intersection ahead when he's just approaching rotation speed,* **confident** *of a clear deck in that black corridor between runway lights.*

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

REPORT AN INCIDENT,
PREVENT AN ACCIDENT

Think about that you Line Officers. Are all of **your** *people aware of the procedures for crossing runways?*

Wrong MAP – Right Course

ON a recent takeoff from this air station, the pilot of an S-2E aircraft noticed that the No. 1 MAP responded to the No. 2 throttle movements and vice versa. As it was a carqual flight with an "initial qual" pilot in the left seat, the plane commander considered proceeding to the ship and conducting carquals with an obvious but understood malfunction. After some deliberation he decided to abort the mission and return for repairs.

Investigation revealed that the manifold air pressure lines had been reversed on the MAP gage.

The lines were reversed to their proper position and the same two pilots launched to carry out their assigned mission. On takeoff, the starboard fire-warning light illuminated, and fuel fumes were detected in the cockpit. The starboard engine was immediately feathered using the fire-in-flight checklist, and a successful single-engine approach and landing was made at the NAS.

These two occurrences seem entirely unrelated, until one considers the events which may have transpired if the plane commander had not elected to abort after he realized he had a manifold air pressure gage problem. Suppose: "Immediately after a cat shot the starboard engine fire-warning light illuminated and fuel fumes were detected. The fire-in-flight checklist was executed and the pilot *then* noticed that it appeared as though the No. 1 engine had been shut down (the manifold air pressure lines were reversed). In the cockpit at this time you have immediate mass confusion, coupled with inexperience on the part of the 'initial qual' in the left seat. The low altitude, confusion, inexperience and aircraft configuration could be just enough to trigger a tragic aircraft accident."

Fortunately, the above events did not occur. The sound judgment of the plane commander in returning to have an obvious maintenance error corrected, even though the pressure of operational commitments was strong, prevented a potentially dangerous situation.

Perhaps we should use the slogan "Return with an incident to prevent an accident."

Impressedmouse

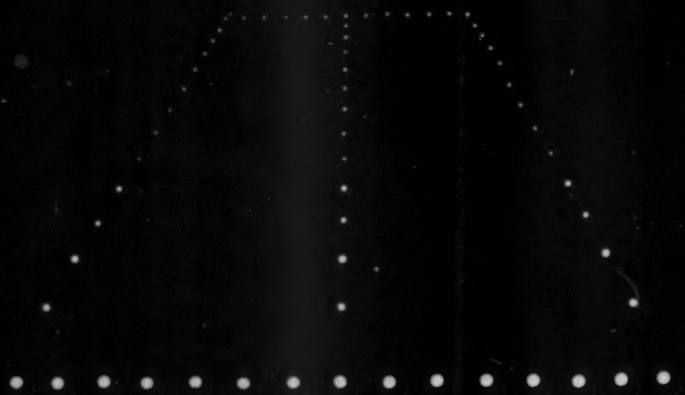
This is a classic example of proper headwork on the part of a pilot-in-command. He reasoned, and rightfully so, that this particular mission was not of sufficient urgency to require that he accept an aircraft with such a "built-in" accident potential as reversed manifold air pressure gages. Hopefully, there are many such examples of professional headwork that we never hear of, yet are instrumental in preventing accidents. Those naval aviation personnel who make safety an everyday way of life contribute immeasurably to the preservation of our Navy's resources, and to all of them we say, "WELL DONE."

Whew!

THIS mouse pulled a boo-boo. He neglected to physically check that the parking brake was set during the prestart checklist prior to a day carrier ASW launch. After starting and performing engine runup, the chocks and chains were removed, and the aircraft moved forward. This resulted from not holding brakes as required when the director gave the signal. Fortunately, this mouse was fast enough to react quickly and apply the brakes. The plane rolled only a foot or so, but it might have been disastrous if the ship had been rolling and the deck slippery.

Complacentmouse

Instead of awarding X lashes with a wet noodle or chastisement in other ways for not complying with the checklist, something new has started. We're thinking of establishing a DELTA SIERRA (dunce supreme) award. If it materializes, you're No. 1. ◄



NCLT

A Complete Approach

By LCDR J. R. McDaniel, VA-125

"515, *Corsair*, Ball, State 56 . . . "

You're a nugget on your first night carrier approach. You have already descended from Marshall in your A-7, completed a TACAN penetration to a precision final, and . . . now you are about to make your first night arrested landing.

The night is dark with no horizon and a 900 to 1200-foot overcast. The light rain adds to an already difficult situation. You have a knot in your stomach as big as a bowling ball and a grip on the stick that would choke a horse.

You search your memory, trying to recall the many points that were stressed during FCLP . . . the LSO's brief prior to manning aircraft . . . what did he say? Let's see . . . "You'll feel high and have an urge to descend to bring the carrier deck into the same perspective as a normal night field landing . . . remember to check the dropline lights – they'll help with early lineup problems . . . Keep it lined up and, above all, *watch that ball!*" . . . Scan . . . meatball . . . lineup . . . angle-of-attack . . . Man, I sure feel high. I'll bolter for sure . . .

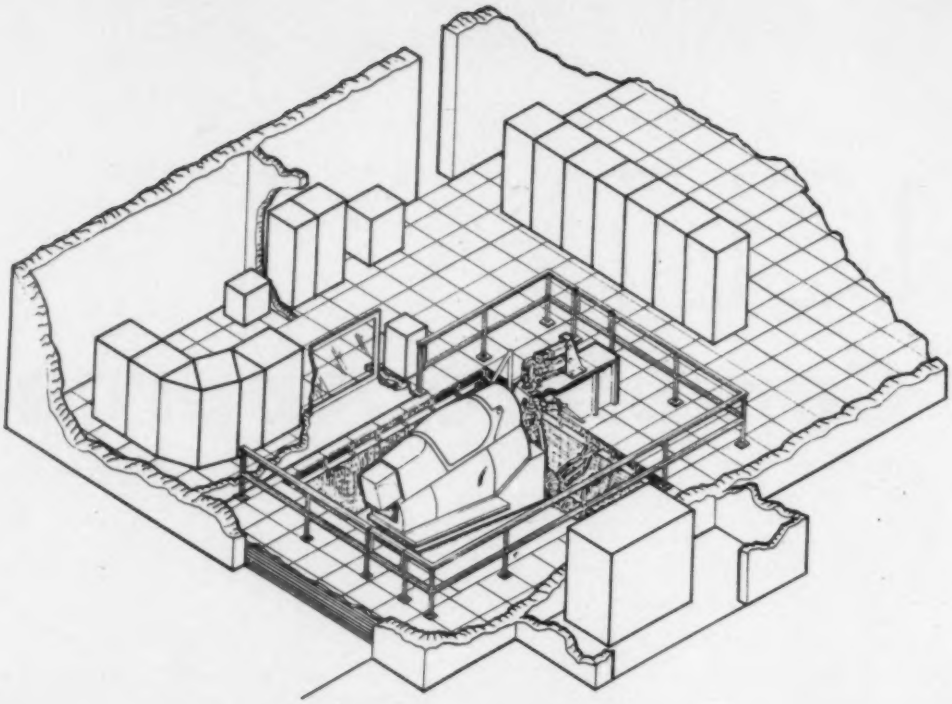
Will He Make It?

Will our intrepid young naval aviator complete his night CQ successfully and uneventfully? More than likely. He has had the benefit of the best training available in preparation for this moment of truth. Moreover, the LSO and numerous supervisors in the chain of command, through close observation, have determined to the best of their ability that he is "ready." Nevertheless, there are two factors which cause an element of uncertainty, however small. They are:

- The pilot's lack of actual experience in an environment, real or simulated, which is fully comparable to the night carrier landing pattern.
- The inability of the LSO and supervisors to precisely evaluate the pilot's abilities, habit patterns and predict his actions and reactions to various stresses and stimuli.

By way of discussion, we know that a fledgling naval aviator gets many periods of night FCLP (Field Carrier Landing Practice) before going to the ship. This gives the pilot experience in manipulating his aircraft on, about, and around the prescribed glide slope. This night practice includes landings on a simulated carrier deck. This helps immeasurably in preparing a pilot for night CQ. Even so, no one would maintain that this environment is fully comparable to the actual night carrier landing environment.

For one thing, there is less relative motion between the aircraft and the real deck than there is between the aircraft and the simulated deck. The result is, at sea the pilot has the illusion of flying a steeper glide slope. For another thing, the pilot in the FCLP pattern usually has many visual cues (lights from the tower, buildings, roads, etc.) which are missing at sea. There are other differences, too – mainly psychological – but the point is clear: the FCLP pattern cannot fully compare to the



NCLT Facility Arrangement Sketch
Fig. 1

night carrier landing pattern.

The LSO's/CO's evaluation of the pilot also suffers in the night FCLP pattern. True, field practice does provide a reasonably good idea of pilot tendencies, but it is nearly impossible for the LSO to detect precisely what control inputs an aviator applies in response to visual cues presented by the Fresnel Lens and simulated carrier deck. Indications of proper techniques are mainly limited to the result of corrections made during the approach.

NCLT – A Valuable New Tool

Modern technology has produced a new tool – the NCLT (Night Carrier Landing Trainer) – which promises to eliminate many of the unknowns from night carrier landing practice for pilots of at least one series of aircraft – the A-7. Specifically, the NCLT (See Fig. 1) is expected to provide:

- A precise simulation of the night carrier landing environment.
- A means whereby supervisors can more thoroughly evaluate pilot abilities, tendencies and habit patterns.
- A more effective means of instructing pilots in desired skills.
- A means of predicting pilot performance in the night carrier landing pattern.

Note: The Navy now owns two NCLTs designed to simulate A-7 aircraft. Plans are for these units to be installed at NAS Lemoore and NAS Cecil Field by May 1972.

NCLT – A Description

Device 2F103, the NCLT, is a simulator designed to train A-7 pilots in night carrier landing approaches and operations. Its primary employment is expected to be the training of pilots for initial night carrier landings; however, it can also be used by more experienced pilots in maintaining or regaining night carrier landing proficiency.

It will provide a close instructor-trainee relationship in night carrier landing approach procedures, from initial approach fix to letdown, touchdown, waveoff or bolter.

Simulated aircraft motion, instrument readouts, and a real-time display on a color cathode ray tube of a night carrier landing environment, will provide a simulated night carrier approach situation that must be continually monitored, corrected, and flown to conclusion by the

pilot. The instructor controls the difficulty of each training session. He can set up an approach with no environmental variables (wind, visibility, or sea state), or he can increase the difficulty by adding and increasing the intensity of the variables.

Aerodynamic characteristics of the A-7B and A-7E aircraft are programmed into the computer. As the pilot induces aerodynamic variables by moving a standard set of flight controls, the motion base, instruments, and visual display present kinesthetic cues simulating actual flight motion which will require corrective action for a successful "trap."

The pilot station is a simulated A-7E cockpit with those instruments, indicators, and controls required for an approach and landing (or bolter) in the carrier environment. Pilot control inputs are supplied through the computer to instruments, visual display, and the motion base.

The instructor's station contains all switches and controls required to set up, control, or vary the training program. Repeater instruments, indicators, lights, and visual display are provided to monitor the pilot's actions. An x-y plotter, on-line printer, and an approach rerun or freeze capability are available to assist the instructor in evaluating the pilot-under-instruction.

The motion base, on which the simulator is mounted, receives hydraulic pressure from the power supply station to move the simulator, simulating aircraft motion.

Simulated sound is provided by a sound generating system which provides a realistic audio environment throughout the training problem.

A visual display on a cathode ray tube is provided for the pilot with a repeater at the instructor's station. An extremely realistic visual representation of a carrier environment is presented on the tube along with data link and HUD (Heads Up Display) symbology as selected by the pilot. The NCLT is fully capable of presenting displays of both CVA-42 and CVA-59 class carriers. In addition, the following conditions are fully variable in degree:

- Weather.
- Wind speed and direction.
- Aircraft altitude.
- Approach starting point.
- Visibility.
- Ship's heading and speed.
- Turbulence.
- Sea state.
- Horizon line.

The NCLT is also capable of a Mode II ACL (Automatic Carrier Landing).

The TF41 or TF30-P408 engine RPM, fuel consumption, and sounds are simulated to give visual, aural, and motion cues as received in actual flight. Engine system cues are directly proportional to throttle movement.

Flight controls, communication, and navigation systems are real aircraft parts. The stick, with a trim switch, and the rudder pedals, minus brakes, use damping systems to simulate aircraft feel.

The radios, navigation and data link plus the HUD equipment are controlled by the pilot and directed to the computer. Proper operation of the system controls will generate the proper signals or symbology. The instructor station is used and set up as the carrier transmitter/receiver requiring the pilot to tune to the same channel or frequency.

A crash simulation occurs, with warning lights and sound effects if the aircraft experiences any of the following at touchdown:

- Exceeds 23 feet-per-second rate of descent.
- Exceeds 20-feet lateral displacement from centerline.
- Ramp strike.
- Water impact.
- Landing attitude is such that structural damage would occur to the aircraft.

Background of Development

The NCLT, designed and built by Vought Aeronautics Corporation, was conceived in the spring of 1968 for use as a design tool in the VFX competition. The F-111B was plagued with carrier suitability problems so a real time simulation of the carrier approach task appeared ideal to avoid similar problems with F-14 candidate designs. Management go-ahead was received early in May and by mid-July an experimental test pilot was making simulated arrested landings.

The flying qualitities group in the aero and hydro branch of NAVAIRSYSCOM were quick to recognize the potential of a good carrier approach simulator and arranged for an A-7 carrier suitability project test pilot to fly and evaluate the simulator. Following his enthusiastic endorsement in late July 1968, numerous naval aviators visited the plant and flew the simulator.

One of these visitors was an OPNAV representative who wanted to test the simulator as a trainer. Early in 1969 such a test was conducted using two nuggets and two IPs from VA-174 with very favorable results.

However, the rest of 1969 and early 1970 saw the simulator returned to engineering uses.

The subject of training utilization hadn't died, however. Agreement was gradually being reached on specifications for a trainer, but the Navy needed one last

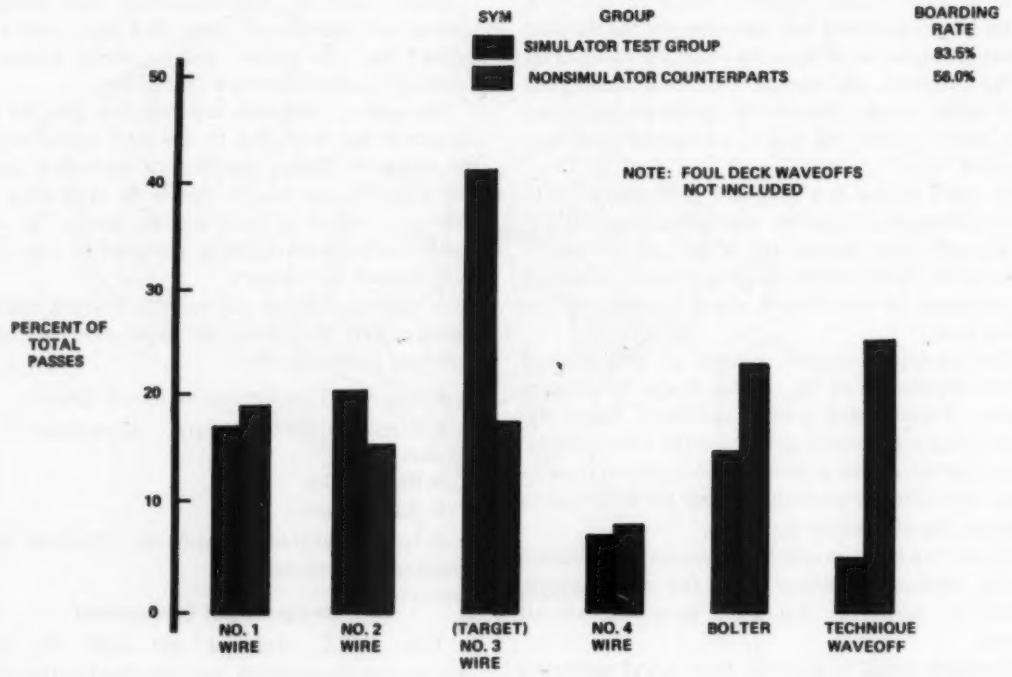


Fig. 2

formal evaluation to measure the "transfer of training," to justify procurement.

For this test, VA-174, VF-201, VF-124, VF-202, VA-122, VA-125, and VA-128 all sent pilots to Dallas for carrier approach simulator training. As a result of these evaluations, several studies were completed which tended to strongly substantiate the usefulness of this device. This provided the justification for the Navy's procurement of two of the trainers. Findings varied from increased boarding rates and improvement in the quality of passes flown, to a substantial reduction in the amount of required FCLP.

An offshoot of the final trainee evaluation produced a totally different approach to CQ training. This approach utilized computer data gained from 400 NCLT approaches to predict pilot performance during initial night CQ. The first objective of this evaluation, as in other NCLT training endeavors, was to see if there were any measurable differences in performance between simulator and non-simulator trained pilots in the areas of boarding rate, wire engagement distribution, and pass-by-pass success rate. Post-CQ evaluation of the first objective showed that:

- There was *measurable improvement* in the performance of NCLT trained pilots over non-simulator trained pilots in the area of boarding rates (Fig. 2).
- The simulator trained pilots had a higher number of three-wire engagements and a *much lower* number of technique waveoffs (Fig. 2).
- The pass-by-pass success rate was *significantly greater* in the approaches flown by NCLT trained pilots (Fig. 3).

The second and prime objective was the comparison of performance predictions made after NCLT training with the actual performance by the FRPs during initial night CQ operations.

In order to make a meaningful evaluation and address those items which inherently cause the greatest difficulties in a night approach, seven areas were selected

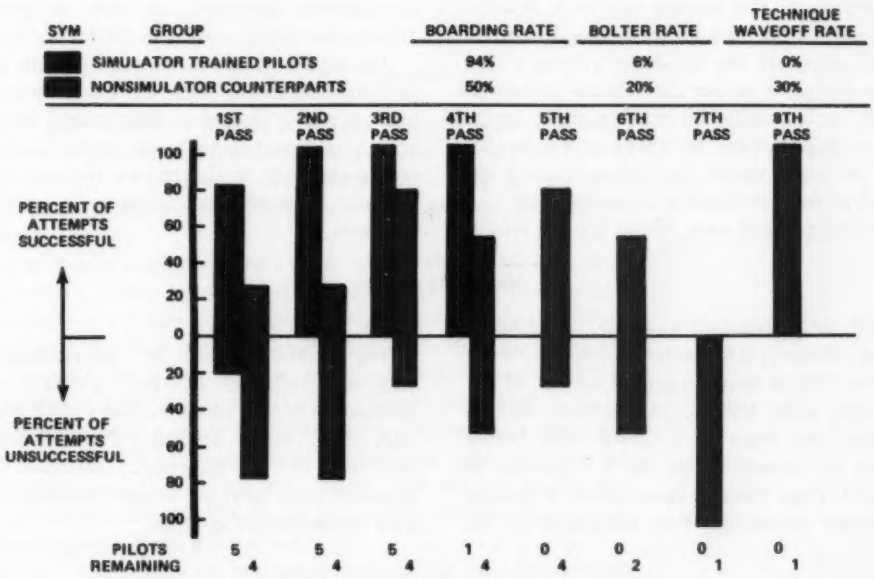


Fig. 3

from simulator data and considered in making pilot performance predictions. The areas considered were:

- Hook to ramp distance.
- Line up in close.
- Line up at touchdown.
- Pitch attitude in close.
- Pitch attitude at touchdown.
- Glide slope error in close.
- Sink rate at touchdown.

When the computer data was analyzed and plotted, significant pilot technique errors were immediately defined from which positive instructional measures could be developed. By calculating the standard deviation, the limits of deviation of the areas selected could be determined. Performance predictions were then made based on their information. The prediction success rate proved to be a positive 75 percent.

Although past evaluations have involved relatively small samples of personnel, there is strong evidence that NCLT will provide substantial advantages in:

- Predictability of pilot actions during initial night CQ.
- The formation of proper responses by the trainee.
- Increased boarding rate and a definite improvement in the quality of approaches flown.
- Acclimation of pilots to a new environment early in the training cycle.

The Outlook

The NCLT promises to be a tool capable of providing realistic and effective night carrier landing training for pilots by closely simulating the carrier and flight environment. By successfully performing all of the course procedures associated with an approach to landing, the trainee will receive training which is beneficial and directly applicable to his carrier assignment.

After or during each NCLT approach, the instructor (LSO) can discuss the problem areas using the

information obtained from the x-y plotter, or the computer print-out displayed on the visual display or on-line printer. The instructor can stop or rerun the approach and point out or explain problem areas.

When combined into a usable syllabus it is expected that each FRP will undergo 8 to 10 hours of intensive instruction in the NCLT which will include all the aforementioned items. This training *may* be in addition to or replace part of the night FCLP training now given. The FRP will complete the simulator training with a thorough knowledge of proper correctional techniques together with a knowledge of what a night carrier approach looks and feels like. He will become somewhat adjusted to the night carrier environment which will alleviate much of the apprehension of the unknown.

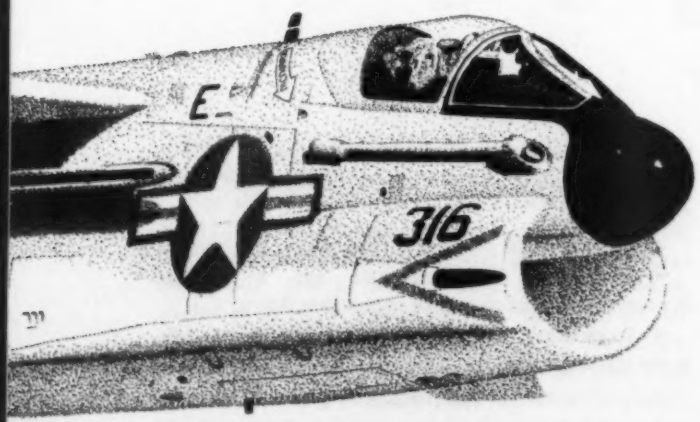
From the LSO point of view, the NCLT will provide an extremely valuable and realistic platform for initial CQ instructions. In the NCLT, the LSO is, in effect, placed in the cockpit with the FRP and can monitor control inputs in real-time. When enough approaches are flown, habit patterns are identified. The pilot thoroughly understands his limitations and the LSO can more completely identify potential pilot weak areas. Concentrated attention can then be given to pilot deficiencies during subsequent NCLT and FCLP periods.

The payoff will be better trained pilots whose actual performances during night CQ can be predicted with a high degree of accuracy. This should have a definite impact in lowering the night carrier landing accident rate, particularly in the case of first-tour aviators, and provide a significant decrease in carrier landing accidents. ◄

About The Author

LCDR MCDANIEL is presently assigned as Training Officer in VA-125 NAS Lemoore. He has served as LSO in three squadrons and as an Air Wing LSO with CVW-5. In addition, he has completed two tours as a CRAW LSO before assuming his present duties. He is a member of the NCLT Fleet Project Team which is charged with design review and fleet acceptance of the device.

The author wishes to acknowledge the invaluable technical assistance provided in the preparation of this article by CAPT C. W. Meshier, USN (Ret), Senior Specialist, Flight Simulation; and Mr. C. E. Mattlage, Technical Project Engineer; both with the Vought Aeronautics Co., LTV Aerospace Corporation.



TEST FLIGHTS

Adapted from COMLATWING msg

DURING the past 2 years there have been numerous mishaps during post-maintenance test flights. Some of these mishaps were the result of poor maintenance practices and/or poor pilot performance. A closer scrutiny of test flight procedures by all concerned is warranted.

A test flight is an exceptionally demanding flight and requires proper preflight preparation. In this regard, a test pilot should be qualified only after demonstrating high motivation, conscientiousness, and professionalism. Furthermore, the interface between the test pilot and quality assurance is an absolute necessity if the flight is to be conducted in a safe manner.

Quality assurance should brief the test pilot on all maintenance actions performed including specific identification of equipment or parts removed or installed. ◄

Bravo Zulu!

CAPT Sidney S. Wade, USMC, VMFA-122

SHORTLY after takeoff in an F-4B on the morning of 9 September 1971, the left generator of CAPT Wade's aircraft dropped off the line and he was unable to reset it. (The bus-tie remained closed.) The aircraft then experienced violent pitch and roll inputs, but stabilized when the stab aug was disengaged.

Deciding to abort the mission, CAPT Wade made a 180-degree turn while descending below a broken cloud layer. During descent, the left fire/overheat light illuminated but was extinguished by retarding the left engine to IDLE. The fire-warning circuit was tested and checked good. As the pilot attempted to jettison ordnance, the stick moved violently from stop to stop in roll. Ten to twenty pounds of stick force was required to stabilize the aircraft.

CAPT Wade jettisoned a centerline PMBR and was attempting to drop the right rocket pod when the left fire/overheat light came on again and remained steady. No other indication of fire was present, but the left engine was secured as a precaution and the light went out. At this time, multiple circuit breakers began to pop and the ICS was lost.

Approaching homebase for an emergency landing, the right fire-warning light began to flicker. The pilot attempted to jettison his external fuel tanks but only the left tank released. By reducing power below 85 percent, the right fire-warning light was extinguished. The emergency jettison button was activated to jettison all external stores; however, the right external tank, which was three-fourths full of fuel, remained on the aircraft. This made it necessary to add power to maintain altitude. The right fire-warning light came on again as power was added.

The landing gear was lowered for landing but CAPT Wade's wingman advised that his nose gear was not fully extended. Investigating, he found the landing gear circuit breaker popped. He reset the circuit breaker, and the landing gear extended normally; however, by this time he was in too close to make a landing. This forced him into a single-engine go-around.

During the go-around, roll inputs to the stick began to increase and the RIO was told over UHF to select command eject in the event it became necessary to abandon the aircraft. However, CAPT Wade was able to maintain control of the aircraft and landed on the second attempt at an airspeed of 170 knots. The E-28 arresting gear was engaged and the remaining engine secured without further incident.

Postflight inspection revealed a failed bleed air duct which caused heat damage to wire bundles and cannon plugs. It is suspected that metal fatigue caused catastrophic failure of the bleed air duct at the weld.

A valuable aircraft was saved through CAPT Wade's competent and professional performance in an extremely hazardous situation.

WELL DONE.

CR

A well-organized pre-accident plan is vital to an aviation unit. Testing the plan under simulated conditions is an excellent way to find out just how effective it really is. Just such a project was carried out by NAS Barbers Point and the events which took place are detailed in the following article.

ASH

(A simulated aircraft accident)

Top Left – Where the action starts – reporting the accident.
Top Center – Crash-fire control.
Top Right – Issuing security equipment.
Left Center – Evacuating casualties.
Right Center – Initial crash scene; regardless of appearances, be prepared for the worst – flashfires or explosion of fuel fumes, ordnance, etc.
Bottom Right – Medical, investigative and security personnel execute assigned duties.

AFTER revising the NAS Barbers Point pre-accident plan, LT James Browning, ASO, wanted to know if the plan was workable. To ensure that all tasked departments and individuals knew and understood their responsibilities in the event of a crash, he proposed to conduct a full crash drill. With the complete support of the Commanding Officer, CAPT P. C. Cooper, the drill was set for 0800 on 21 October 1971.

The areas of responsibility to be covered were:

- Response time of emergency vehicles.
- Firefighting techniques.
- Control of rescue operations.
- Medical department.
- Use of structural fire department equipment.
- Weapons command post.
- Security of the wreckage.
- Handling of the press.
- Use of the crash-grid map.
- Involved duty officers.
- Chaplain and CACO (Casualty Assistance Calls Officer).
- Aircraft accident board duties.
- Required reports.

A C-47 hulk was towed to an area frequently traveled by vehicles and a likely spot for an aircraft to crash on takeoff. To make the drill even more realistic, three crewmembers were tagged with various injuries and dummies were tagged fatalities.

At 0800 smoke grenades were set off in and near the aircraft along with a controlled fire adjacent to the aircraft. Upon sighting the smoke, tower personnel initiated the drill by coming up on the crash circuit. From that moment on, everything was handled as if the "real thing" had happened.

50809

All emergency vehicles responded including the EOD (Explosive Ordnance Disposal) from NAD West Loch. Civilian security police and Marines secured the area while the weapons department set up a command post. Medical department personnel treated the tagged injured personnel at the scene, and then transported them to the hospital. They also made arrangements for the simulated fatalities. The accident board arrived and commenced its investigation.

To add another note of realism to the proceedings, two individuals acted as reporters from the local newspapers, and eight others were assigned as "onlookers," "souvenir hunters" and the like. All 10 were tasked to infiltrate the crash area, interview the "survivors," pick up parts, etc. by any means possible and without proper clearance.

In order to detect possible areas of confusion, all accident board members, duty officers, and other involved personnel were directed to fill out all required reports and carry out their assigned tasks as if an actual mishap had occurred.

After the drill was terminated, LT Browning conducted a comprehensive analysis of the events that had transpired. It was concluded that the mechanics of the pre-accident plan were valid, however, there were two problem areas which proved worth noting:

(1) Communications – Getting "the word" from the scene back to those persons requiring the information. *(Walkie-Talkies, field phones, vehicular two-way radio systems are recommended – Ed.)*

(2) Area security – Trying to determine which individuals are required at the crash scene is extremely difficult. Needless to say, those personnel needed must have easy access, but security personnel won't normally know them personally. *(The use of authenticated identification badges is a solution to the problem – Ed.)*

In the final analysis, this crash drill was highly successful. NAS Barbers Point is confident it can handle any aircraft emergency expeditiously and professionally.

Upper Left – Accident board member identifies part.
Upper Right – Casualty Assistance Officer and Chaplain work out reports and set up notification actions.
Bottom Left – LT Browning (drill coordinator) and drill observers.
Bottom Center – ODO, ASO and CDO prepared initial message report of aircraft accident.
Bottom Right – Accident board in on-scene session.

Can Your Activity Say the Same?

A CRASH drill such as the one conducted at NAS Barbers Point can be of great value in finding deficiencies in your pre-accident plan and much can be learned before an actual mishap occurs.

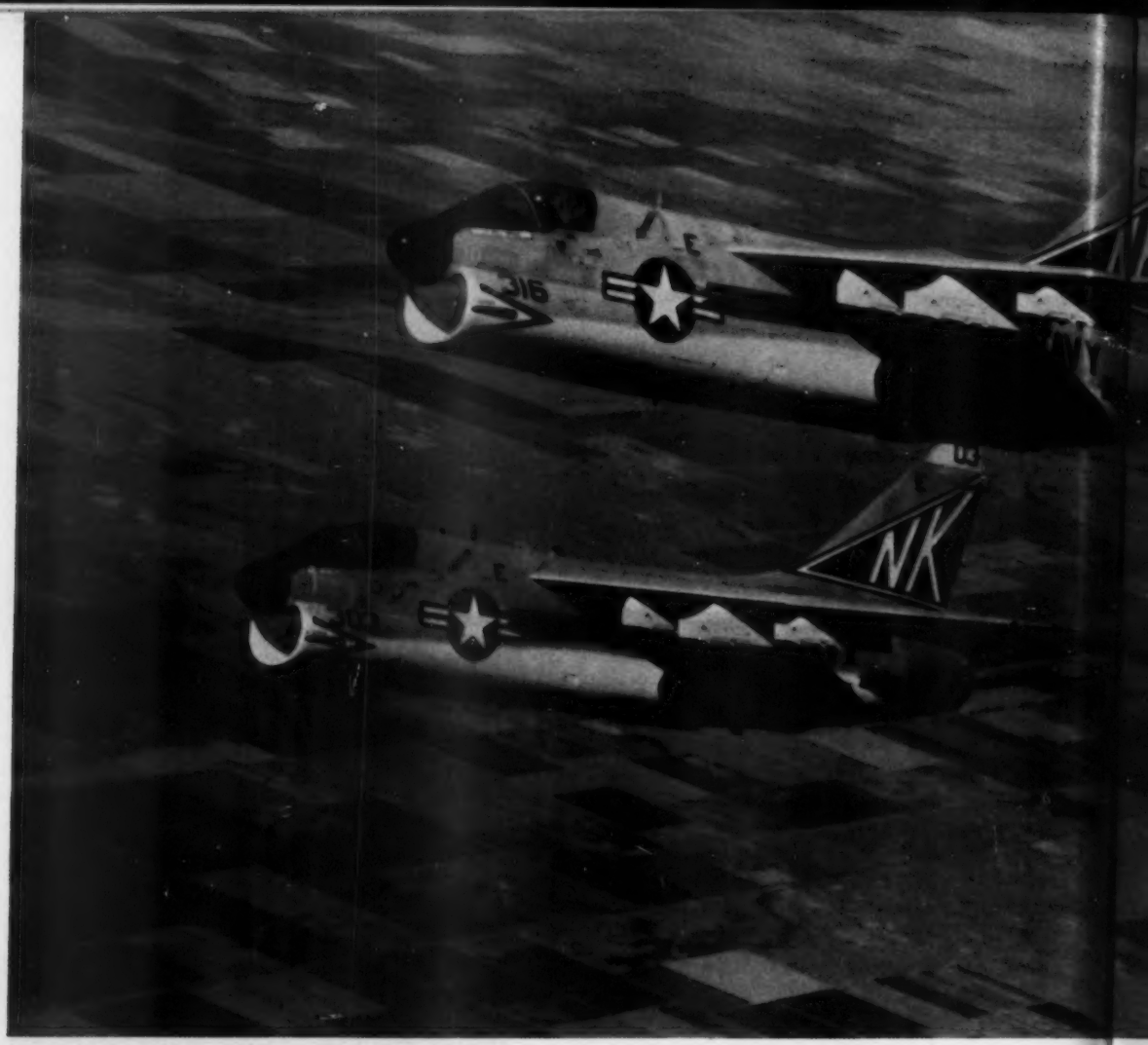
Naval air facilities might also consider conducting an off-base crash drill in cooperation with local civilian authorities. Communications, security, getting necessary personnel to the scene, vehicular movement, etc. are much more difficult in this environment than on-base.

Often civil authorities arrive at the scene of a military accident prior to military personnel, and their professional efforts in the past have been most helpful and efficient. There is a booklet entitled "WHAT TO DO AND HOW TO REPORT MILITARY AIRCRAFT ACCIDENTS" which is intended as a guide for United States civil authorities. These booklets can be obtained through the Naval Safety Center or by contacting the nearest military base and asking for Joint Service Bulletin #1, title as listed above. In addition, there is a film entitled "A NIGHT ON JACK RABBIT MESA" which was prepared as a related training aid in connection with the booklet. The film may be procured under the following film numbers:

U.S. Navy MV 10537
U.S. Army MF 46 5290
U.S. Air Force SFP 1392

It might be well to offer periodic refresher and orientation courses in military equipment, such as ejection seats, to groups including police, highway patrolmen, forestry service agents, sheriffs, civil firemen (paid and volunteer), ambulance and hospital emergency personnel, civil defense workers, and others who may share a common interest.

To finalize, we would like to stress the importance of having the necessary emergency equipment ready in the event of an aircraft accident. A crash vehicle which arrives on the scene without proper equipment may be useless. Take the time now to make a list of what is needed off-base. If items are missing, procure them. Then stow everything in an emergency kit, and make sure it is ready and available if needed.



CRUISE CLEARANCES

FAA Advisory Circular 90-54 provides information concerning amended cruise clearance procedures which became effective on 1 October 1971.

Discussion

A cruise clearance is an air traffic control service that has been provided and used by pilots for quite some time and is *normally used in uncongested areas for short duration flights*. Because questions have arisen as to controller application and pilot responsibilities when operating under a cruise clearance, the procedure has been rewritten for clarification purposes. The amended procedure is definitive as to controller application and more clearly provides the means for the pilot to use the provisions of the Federal Aviation Regulations when proceeding to an airport that is within/below/outside controller airspace with or without a prescribed/approved instrument approach procedure and yet retain search and rescue protection.

Procedures

• To ensure complete understanding between pilot and controller the following will be included in the Airman's Information Manual and the air traffic control handbooks:

"*Cruise* – a word used in an ATC clearance to

indicate to a pilot that climb to and descent from the assigned altitude may be made at his discretion. Further, it is approval for the pilot to proceed to and make an approach at destination airport and can be used in conjunction with:

"(1) An airport clearance limit at locations with an approved/prescribed instrument approach procedure. The FAR's require that, if an instrument letdown to an airport is necessary, the pilot shall make the letdown in accordance with an approved/prescribed instrument approach procedure for that airport, or

"(2) An airport clearance limit at locations that are within/below/outside controlled airspace and without an approved/prescribed instrument approach procedure. Such a clearance is *not authorization* for the pilot to descend under IFR conditions below applicable MEA/MOCA nor does it imply that ATC is exercising control over aircraft in uncontrolled airspace; however, it provides a means for the aircraft to proceed to destination airport, descend and land in accordance with applicable FAR's governing VFR flight operations. Also, this provides search and rescue protection until such time as the IFR flight plan is closed."

• Some specific examples of what a cruise clearance provides and what is expected of the pilot are as follows:

(1) Clearance for flight conducted solely within controlled airspace to a destination airport served by a prescribed/approved instrument approach procedure would read: (aircraft ident), cleared to (name of airport) via (route), cruise (altitude). Air traffic control is advising the pilot that climb to and descent from assigned altitude can be made at pilot's discretion and that there is no known IFR traffic between the assigned altitude and the applicable minimum enroute IFR altitude/minimum obstruction clearance altitude. It further authorizes the pilot to execute any prescribed/approved instrument approach procedure serving the destination airport, if necessary, and that the associated approach airspace (including missed approach procedures) is free of any known IFR traffic.

(2) For a flight into an airport within/below/outside controlled airspace, but without a prescribed/approved instrument approach procedure, the clearance would read the same as (1) above. The difference here is the fact that the airport does not have a prescribed/approved instrument approach procedure and that a portion of the flight may be conducted in uncontrolled airspace. The pilot would be expected to, upon arrival at destination airport, make descent below applicable minimum enroute IFR altitude/minimum obstruction clearance altitude and land in accordance with applicable Federal Aviation Regulations governing VFR operations; however, if IFR conditions existed upon arrival, the pilot would be expected to advise air traffic control and request further clearance.

• It is the pilot's responsibility to adhere to the applicable Federal Aviation Regulations in both situations (1) and (2) above, when conducting a flight into any airport that may be within/below/outside controlled airspace whether served with a prescribed/approved instrument approach procedure or not. Air traffic control is only providing the means for the pilot to use the applicable Federal Aviation Regulations provisions. ◄

How does it feel alone in the blue?
When things get tough
And the going gets rough
How does it feel, Echo Two?

The Overdue Hummer

By CWO P. W. Meyn, USN

THE days were long, the work tiring and the scene unchanging as we conducted flight operations in the cold, forbidding waters of the North Atlantic. This day the air wing was flying as usual and undoubtedly entries in various log books were written "routine operations at sea." The enemy knew we were out there somewhere. Our approach was no secret but rather more of a game, like hide-and-seek; with the enemy being *it*.

After the evening brief, conducted by the staff onboard, a conversation ensued between the maintenance chief and the pilot of the duty *Hummer*.

"How much fuel will you need, sir?"

"Fill 'er up. Say, chief, I think we ought to fill her *all* the way." (A normal full load was about 400 pounds short.)

"Suit yourself, sir. In view of the forecast weather and mission duration, I think it's a good idea."

"OK, chief, fill two; mine and a spare."

Following fueling it was necessary to get clearance to check out the systems. Permission was granted, and the checkout began. Minor discrepancies reared their ugly heads, but sharp technicians proceeded to clip them off, one by one, until all systems looked good.

Later that night the alert crew was called away to

man up and check their aircraft. The signal was given – turn No. 2, and "whoom" the huffer bellowed as the blades began to spin. Suddenly the blades slowed to a stop and it became apparent that a starter had blown. The pilot said, "Well, there goes the primary. How 'bout the spare?" Activity on the flight deck suddenly increased, and the bos'n roared, "Get that %*@/? *Hummer* off the cat and stick it in the corral! I hate those *Hummers*! I gotta shift my deck every *!&$@ time for a down bird!"

The flight crew went below, got some chow and relaxed, but they knew full well they'd be called away again. They were. The wheels were set in motion once again, and the word was passed throughout the ship. Engines spun as the crew tightened their straps waiting for the pilot's word that all was well. Soon they would be on their way. In rapid fire order:

Tension.
Crew ready?
Thumbs up.
Salute.
Catapult!

Busy hands and a sharp crew quickly brought all systems on the line. As the *Hummer* climbed out, the crew heard the words, "Yoo-hoo," which means, I see you and all systems are go. Glory be. Will wonders never cease? The crew's work then becomes a continuous routine of tracking targets, relaying messages, knowing where they are, and keeping tabs on their fuel state.

During the flight they checked a few contacts – no trouble with screen saturation over the North Atlantic in the wintertime. Who's fool enough to fly up there anyway? Well, "they" fly up there and a commercial plane or two but that's about all.

Much later, with "Mickey's" hands in the right position, it was time to return to that little postage stamp on the sea. At times like these there's no choice; it's the postage stamp or wet. If you look out the window all you see is water, water and more water. The crew took a cut on Homeplate and someone on the intercom said, "It's a piece of cake, no sweat." Then the first inkling that maybe there *would* be a little sweat with, oh, oh! showers and a sudden drop in visibility. The pilot on the intercom asked, "Radar, what does the big eye show? Do you hold the carrier?" The reply was reassuring, "Yeah, I got her 178 degrees, 48 miles." Another voice on the intercom allowed as how the fuel ration planned for the mission had just about been consumed.

A voice from Homeplate advised the *Hummer* they were in contact. "Come to 270 degrees and commence descent." The next advisory was to alert the aircraft to a position 3 miles out on final. The plane broke out of the clouds at 200 feet, but there was no carrier in sight. Their next advisory was, "Overhead." Overhead what? The crew saw nothing. Flight deck personnel saw nothing nor heard anything. The time was now: mission plus 45. On the ship, air ops knew the aircraft could not stay airborne much longer.

Meanwhile, back at the ship, a second *Hummer* was manned for a possible search mission. The helo was spotted and turned up. The deck was clear and ready. The Air Boss bellowed, "She's lost everything but guard. All she's got is guard."

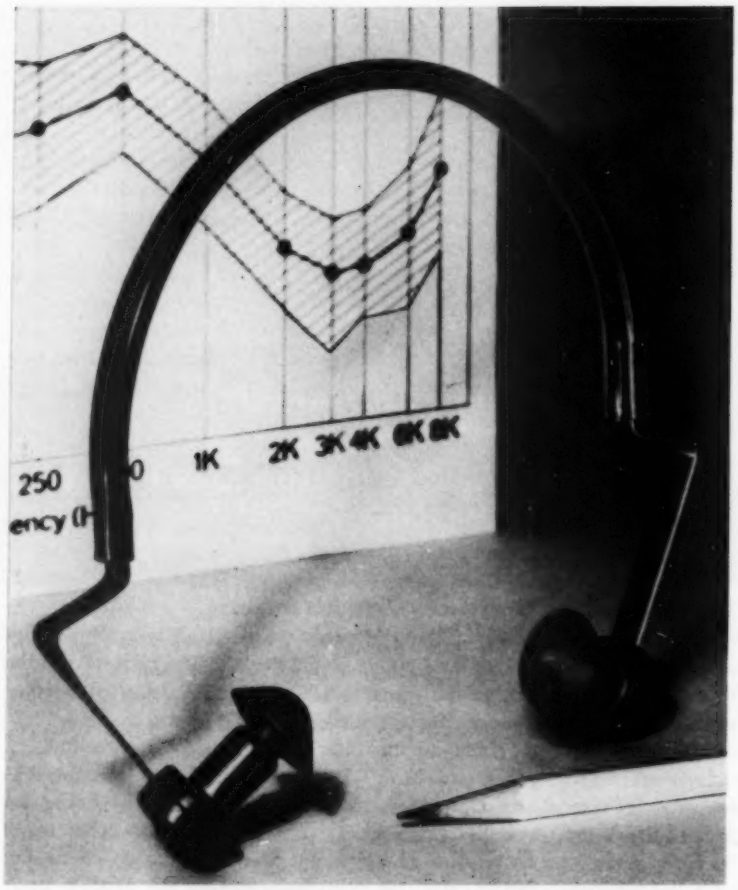
In the *Hummer* there was also concern. The crew had secured the radar when the ship advised initially they were in contact. The pilot informed the crew of the situation, and the ditching bill was reviewed. None of the *Hummer's* navaids gave any indication of Homeplate. There was very little fuel remaining.

Joy! The little needle on the backup system swings around and points to Homeplate. The pilot advises the ship he has contact! Now it's just a question of whether there are enough fumes to make it or not.

A few minutes later the pilot calls, "Critical fuel, 12 miles, straight in." The carrier acknowledges his position and state. Seconds later the *Hummer* is picked up visually. It becomes a race against minutes. They could flame out on approach. If they make the deck and bolter, will the bird have enough for another pass? Probably not. It's a one-shot approach and they'd better catch a wire. The *Hummer* eases over the fantail, whump, hits the deck and (beautiful sight) catches the No. 1 wire! Thank the Lord. They're safe.

There is ample fuel remaining to taxi forward and shut down. Time: mission plus 1.2. That extra fuel was the difference. The crew emerges tired, pale and thankful. They have a right to be. They have just completed a successful mission, and the longest *Hummer* flight over the North Atlantic.

Was a "full bag" too much fuel for a flight like this? Was it too much trouble to clean up the overflow after filling to capacity? Before you answer, remember, some of the sweat left in the *Hummer* might have been yours.



New Hearing Protector

A NEW hearing protector is now available in the federal supply system. It consists of a pair of ear plugs on a headband (see photo).

This device can be worn under a battle helmet or hardhat, a sailor's or officer's cap, and most welding masks. It can even be worn under standard earmuffs for "belt and suspender protection."

Supply nomenclature is Plug, Ear, Hearing Protection, Single Flange, Universal Fit. The stock number is FSN 6515-181-8058.

All Too Common

AN A-4 pilot sustained second degree flash burns of his forearms in an explosion resulting from an overland midair collision with another A-4. He was flying with his nomex flight suit sleeves pushed up.

Although portions of his nomex flight suit and anti-G suit melted from the intense heat and flames, the only body burns were on both forearms and two places on his right arm where his flight suit was torn in the accident.

(He also sustained burns of the face when his visor was shattered in the collision, and his left arm was broken.)

The collision ripped open the entire left side of his cockpit. With presence of mind, despite his injuries, he managed to pull the face curtain with his right hand.

"Continued emphasis must be placed on the need to use all safety gear in the proper fashion," the investigating flight surgeon writes. "Pilots who fly with their flight suit sleeves pushed up are all too common. This pilot's burns clearly indicate the danger of this practice."

Sucked In

AFTER recovery, an F-4B was taxied forward on the starboard side of the flight deck. The plane director gave a left turn signal to bring the aircraft across the catapult track for diagonal parking. However, because of a greasy cat track and high winds, considerable difficulty was encountered as the nosewheel tended to slide directly forward along the track instead of crossing it.

The director called for assistance from the blue shirts to push the nose from the starboard side. Without being specifically directed to do so, an AN crossed under the aircraft aft of the nose gear from port to starboard.

The pilot added power while following plane director signals, and just as the AN straightened up, he was sucked into the starboard intake.

Although several people witnessed the incident, a normal

notes from your flight surgeon

shutdown was executed. Sparks flying from the exhaust of the starboard engine alerted some of the maintenance personnel. An ADJ2 who climbed into the intake after shutdown found the victim. He had sustained major injuries.

Environmental factors set up the conditions for this incident, the investigating flight surgeon reports. "However," he says, "human factors also played a major role.

"Overconfidence, or at least a large degree of complacency, would seem to be the main human ingredient here," he states.

"In the very noisy and often windy environment of an operational flight deck where you are deprived of much auditory and tactile inputs, you must rely primarily on visual cues. Unfortunately, the great force of suction generated at a jet intake cannot be 'seen.' The tremendous kinetic energy of a turning prop is much more evident. Consequently, complacency around jet intakes germinates and insidiously progresses until an accident such as this occurs.

"The AN was apparently motivated by an earnest desire to assist in any way possible in flight deck operations," the flight surgeon continues. "However, this occurrence emphasizes the importance of adherence to strict organization in flight deck evolutions, both routine and atypical. In the handling of this aircraft, the number and placement of personnel should have been under full and direct control of the plane director.

"Needless to say, a healthy respect for intakes should be constantly maintained."

The flight surgeon recommends that flight deck personnel be regularly reindoctrinated on flight deck hazards, proper procedures for various flight deck situations, and the importance of prompt, positive action in cases of emergency.

Sunglass Lenses

A PILOT recently wrote the Naval Safety Center that, in his opinion, the present sunglasses (FSN 9D8465-753-6261) being used by pilots and aircrewmen are a hazard due to the fact that they will chip and shatter when hit. Particles of glass could easily become lodged in the wearer's eye. He recommended that the glass lenses be replaced by a plastic type.

This is a problem which will literally disappear in time as far as *new* sunglass lenses are concerned. As of 31 December 1971 manufacture of impact-resistant eye and sunglass lenses became compulsory under conditions listed in the Federal Register, Vol. 36, No. 95.

Relative to current policies on conservation of eyesight in general, OPNAVINST 5100.14 of 11 August 1970, Manual of Shore Safety Program Regulations and Accident/Injury Reporting Techniques, covers the Navy's sight conservation program for civilian employees and military personnel. Commanding officers are responsible for implementing the sight conservation program in their activities. When the activity eye hazard determination committee makes recommendations, a CO can state by directive that eye protection must be worn by personnel engaged in certain operations or by persons entering areas designated as eye-hazardous. A table of various types of protective eyewear appears in NAVMAT P-10470, the Safety Equipment Manual, July 1969.

Could Have Crushed

AFTER disembarking from the cockpit of an F-4, a pilot turned back to remove his helmet and oxygen mask.

As he leaned in the cockpit to disconnect the oxygen mask from the quick disconnect fittings, the canopy began to close. He couldn't see what was happening at first, but as the canopy touched him, he realized the danger. Jumping back, he fell to the flight deck and fractured his left heel.

Investigators found that the canopy activating mechanism was functioning normally. On the assumption that actuators do not actuate themselves, and due to the fact that the pilot was working with his oxygen hose near the actuator, it was concluded that he had inadvertently struck the actuating lever.

"One can only reemphasize that in a ground or hangar situation," the reporting flight surgeon states, "the ejection seat is not the only potential source of danger in a cockpit. In this case, had the canopy been quicker or the pilot slower, a more serious mishap would have resulted."

Don't Apologize for Safety

By LCOL Oliver A. Lazare, USAF
Aircraft Force Applications
DOXFX Hq SAC

Courtesy Combat Crew Magazine

TRADITIONALLY, we apologize for safety. Recall the number of safety presentations you've attended that started with "this will only take 5 minutes." This is like saying, "We are wasting our time, but we've got to do it," adding to the negative thoughts often associated with the word *safety*.

At times, our complacency and knowledge of the subject will cause us to deemphasize the necessity of the safety presentation. We are so familiar with the material that we assume it to be common knowledge. To avoid insulting someone's intelligence through the redundancy of the message, we apologetically skim over the material. This broad brush delivery is totally unprofessional. Such an unfavorable attitude will infect a unit at all levels of command and supervision.

There is another reason why an individual would tone down the impact of a meaningful adjective or presentation. Most often the material is laid on him and does not reflect any of his thoughts, therefore, he rejects it. Since he was not part of the conception of the idea, he seeks the approval of his fellow workers by disassociating himself from it. He projects this image as a good guy to gain the approval of the group. He hopes to be accepted by the group and enjoy their unity against the message.

Two-Way Communication

It is the ambition of every manager and supervisor to contribute to the input of information that will formulate new policy. Individuals who have been made to feel like cogs in the machine will behave like cogs in the machine. They will not produce ideas for change. On the contrary, they will resist such ideas when produced by others. Men like to believe that their efforts as individuals will mean something for the whole organization and be recognized.

This individual recognition can best be implemented if the boss creates an atmosphere in which the supervisors can freely voice an opinion – as long as the topic is still in the discussion stage. The new policy may or may not include their individual inputs, but each level of supervision will feel they are being read in on what's going on.

When we fail to establish a sound procedure for communications feedback, and fail to accept some initiative and creative thinking, we become prisoners of procedures. "The rule book grows fatter as the ideas grow fewer." Thus almost every well-established organization is a coral reef of procedures that were laid down to achieve some long past objective.

Never apologize for safety. Be dynamic and outgoing in your delivery. Change is always risky, usually uncomfortable, and often painful. *It isn't accomplished*

by apathetic men. It requires high motivation to break through the rigidities of the established organization. This factor of motivation is a hard one to pin down. Why is it that we can always find one individual in a group who has that extra drive, enthusiasm, and energy that makes him stand head and shoulders above everyone else? One reason is that he has deep, personal convictions about the job he is doing. These strong feelings are enough to let him bounce off defeats, climb over obstacles and do his job with fervor and enthusiasm. You can always find a lot of energy to do the job that you know needs to be done.

Participation Management

Work for a more participative form of management in a safety program. Make sure subordinates participate in the creation and structuring of the program, and in day-by-day operation of the program. You need and want a free exchange of information. Encourage all supervisors at the working level to identify in-house problems. They know where the problems are and, in most cases, have the capability to solve the problem.

Instead of a one-way channel of information, you need information flowing both ways. Encourage feedback of information from the working level. Your supervisors are in a position to draw on a source of ingenuity and creativity that is virtually unlimited, namely, the ingenuity and creativity available at the working levels of the organization. As managers we must use this wealth of information and know-how in the solution of organizational problems. *The average individual under proper conditions will not only accept responsibility but seek it.*

If you establish the proper atmosphere at the working level, and orient effort with the unit objectives, your goals will be attained. The workers and the immediate supervisors will solve the majority of their problems without direct efforts by management. In other words, *each manager should make decisions within his scope of authority,* and only matters outside his authority should be referred to his superior. This procedure allows top management more time for other things, rather than trying to find or identify problems at the lower levels. Problems that do develop and come to the attention of top management, in most cases, will then be well thought out, and the decision-making process can be choosing one of the alternate solutions presented along with the problem.

Get the Job Done

Now let's evaluate accident prevention activity in terms of how we get the job done right. There can be no question in a commander's mind concerning the fact that his supervisors are responsible and have adequate authority for accident prevention in their areas of responsibility. The supervisor should be more knowledgeable than safety personnel on the portions of safety directives pertaining to his individual activities.

It is the individual responsibility of the supervisor to be an expert on safety and to develop the proper attitude toward safety in his subordinates. Any accident prevention program manager who expects safety personnel to prevent accidents is a manager destined to fail in achievement of program objectives.

When the supervisors at all levels recognize deviations from safe procedures and take positive corrective action, we will remain accident-free. But if the supervisor condones unsafe practices, we have a serious problem. Do you rely on your "safety personnel" to find the safety problems in your area? When we arrive at the point where the supervisor of each area, all the way up the chain of command, accepts his responsibility for safety in his area, we will see a decided reduction in our on-duty accidents.

In the military organization we have inherent hazards. To accomplish the mission and meet our objectives we operate in a hazardous environment. Safety is not first; the mission is first. Safety is a professional way to accomplish the mission without loss of life, injury to people or damage to equipment and/or facilities.

The safety officer must not curtail the mission by smothering the unit with excessive safety requirements. He must establish the minimum safety standards and then, through the commander, insist that they be followed. Are you part of the problem or part of the answer?

What You Can Do

A recommendation is: stop apologizing for safety by first discarding hints of an apologetic attitude in your presentation. This change in attitude will "domino" through the entire structure of the organization to the working level.

Get the supervisors into the act of creative thinking and into the habit of implementing their own ideas. Make certain that each level of supervision knows that they have the authority to solve their own problems at their level. This will develop a team spirit in their accomplishments. The opportunity for subordinates to contribute to problem-solving at the working level will add immeasurably to the effectiveness of the unit.

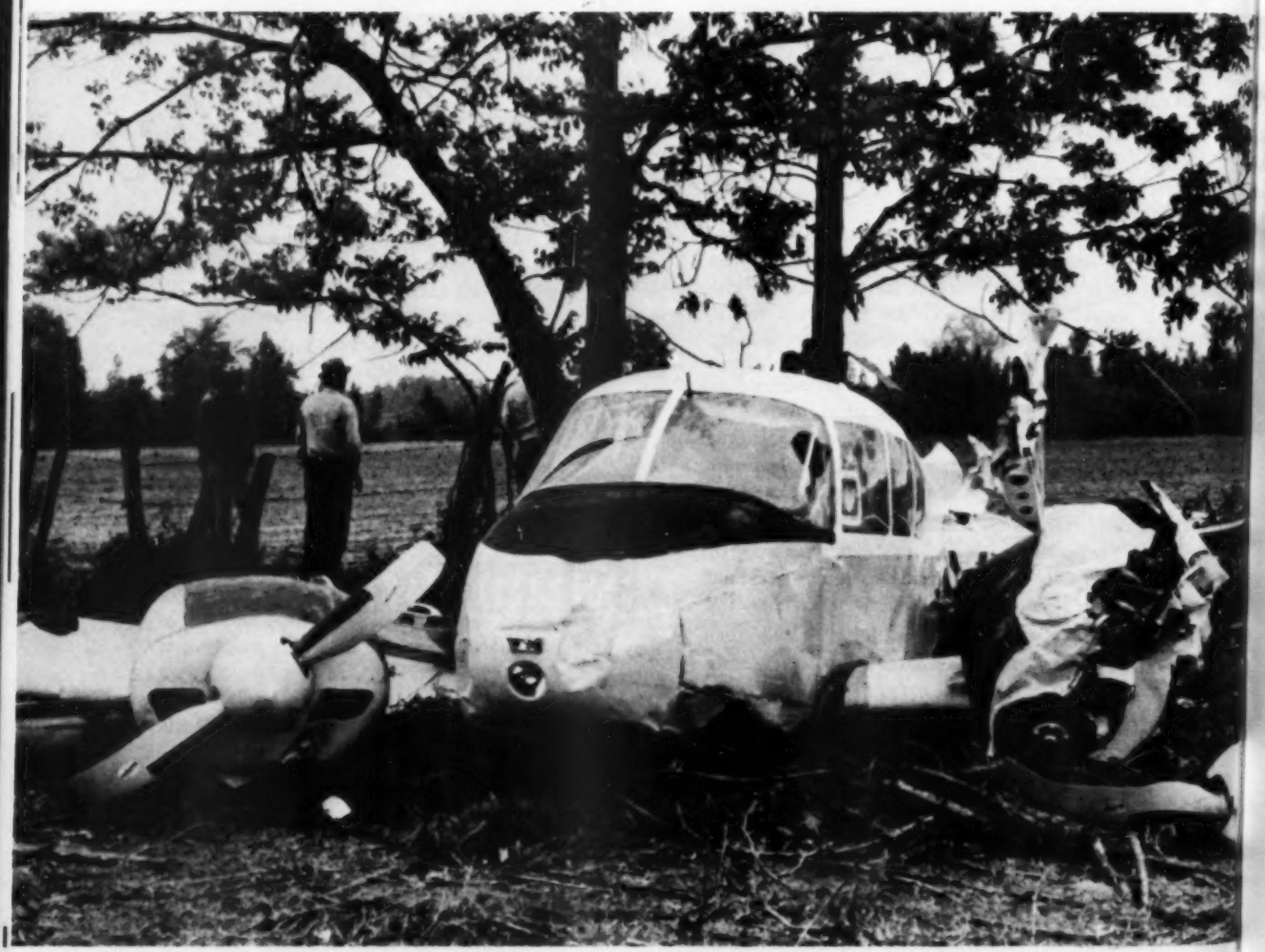
As you develop a positive attitude toward safety and accident prevention, you will see the results multiply through the organizational structure. It is the responsibility of top management to create this atmosphere that will allow all levels of supervision to implement, and sell our safety program. Only then will our organizational safety goals be attained. ◄

Out but not Back

THREE naval aviators attached to a tenant command arrived at homebase operations about 0700 to get their aircraft assignment, prepare their flight plan, and check the weather. Their destination was just over an hour away, and the purpose of the flight was a trip to Mission airport, so that one of the pilots might conduct some business there.

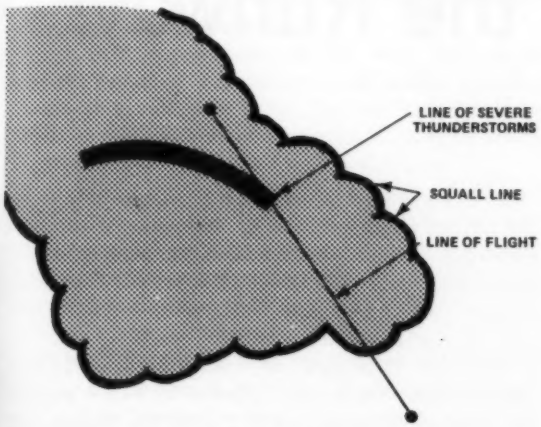
The flight was a routine, administrative cross-country – out and back. They were all experienced aviators, but only the two in the cockpit were qualified in the twin-engine U-11 type they were taking. (None of them realized it that morning, but their return to base would be via ambulance – not by aircraft.)

The weather forecaster at homebase briefed that they would encounter IFR conditions for 50 to 60 miles after departure and then be VFR the rest of the way. They



departed at 0800, and during the 1+15 flight to Mission they were IFR nearly all the way.

On arrival they encountered rainshowers approaching the GCA pickup point. Due to some unexplained reasons the GCA controller turned them on a 4-mile final while they were at 2000 feet (1500 AGL). They were unable to descend quickly enough on the gages, however, they



broke out of the rainshowers in time to see the runway. Simultaneously they canceled the GCA, pulled the power off, made a high-rate descent, and a routine landing. Checking into operations they were surprised to find out that Mission was in Thunderstorm Condition 1.

After 2 hours on deck the trio headed to "weather" for the return flight brief. While "looking things over" a heavy rainshower hovered over the field; so they proceeded to the snack bar to eat – and to wait out the immediate weather.

After eating, they presented themselves again for the weather brief. The forecaster advised that a line of thunderstorms had moved south of the station and become stationary. The pilots took a peek at the scope and saw sizeable weather returns southeast through southwest – beginning about 10 miles from the station and still showing near the bottom of the 60-mile range selected on the display. The forecaster advised them to depart VFR to the east and circumnavigate the rainshowers and thunderstorms.

They were airborne by noon on an IFR flight plan and *cleared southeast*, as filed, on the first leg. The pilot had experienced trouble raising the gear. (Little did he, or the others, know that the best thing that could have happened would have been for the gear to remain down, forcing them to return and land.) On the third recycling attempt the gear came up. The U-11 was now committed. Climbing through 1500 feet they went on the gages.

Fifteen minutes after departure they reached their first checkpoint and reported to Center. They asked for radar vectors around any thunderstorms or known turbulence. Center replied, "Unable, and Next Center will be unable to pick you up. You are departing my area now. Contact Next Center 345.8. If unable, contact Halfway Radio." Before shifting frequencies the pilot and Center had several conversations concerning the correct frequencies for Next Center and Halfway FSS.

The next 10 minutes of flight were fairly routine except no contact was made with Next Center *or* Halfway Radio. They were IFR and not communicating with anyone just at a time when they needed it most.

Their final few minutes airborne began when the aircraft entered a thunderstorm. Their world became instant darkness with severe turbulence, as the two pilots fought the elements. The aircraft was almost completely out of control. The pilot asked the copilot to help him on the controls as the altimeter wound up and then down – varying as much as 2000 feet. The airspeed fluctuated between 80 and 160 knots. All navaids were lost. They had no communications, no navigation aids, and seemingly, no hope of flying through the walls of the thunderstorm. Their only hope was that the wings and stabilator would stay glued to the airframe. If the bird held together they'd have a chance to luck out.

At this point the thunderstorm spit them out the bottom. They were between 300-500 feet AGL in a weather "canyon." It was almost like being in the eye of a hurricane except there was no clear area.

They saw two small fields and unanimously decided to land. The first approach, gear down, had to be waved off because of turbulence, crosswind and no forward visibility in heavy rain. They also noted the field was plowed. The second approach was made gear and flaps up, and they landed about halfway down the field with forward visibility again zero.

The U-11 touched down relatively flat, slid about 500 feet gradually turning left, went through a fence, over a road, and headed straight for a tree. The pilot kicked hard left rudder, for whatever it was worth, and the nose of the plane went dead center between two trees which tore off the wings. All motion stopped, then, complete silence.

The copilot looked up in amazement to see the passenger, still strapped in his seat, outside the aircraft where the starboard wing should have been. All survived! There's an old saw that says, any landing you can walk away from is a good one. This was almost a good one. The pilot was knocked out for a minute or two, but even though groggy he helped the others get away from the debris which only a few minutes before had been an

airplane. A farmer, who had witnessed the accident, transported the crew to the nearest hospital – about 20 miles away. The passenger telephoned homebase to report the accident. Later, a Navy ambulance arrived and took them back to base.

Second guessing, the unusual G-forces which the aircraft encountered while in the thunderstorm cells (15 to 20 minutes), must have severely stressed the aircraft and left no doubt in the minds of the three aviators that it was just a matter of minutes before the plane would begin to disintegrate.

The investigation disclosed several important facts involving dissemination of severe weather information to which the pilots did not have access.

- The weather briefing they received at Mission was the basis on which they planned their return to Overseas.
- The pilots left Mission confident that after the first 15-minute leg they would be VFR and clear not only of the reported weather, but also clear of what they had seen on the scope.
- They were not advised that thunderstorms were imbedded in the overcast.
- They were not advised that a SIGMET Alpha existed in the area they would transit. Mission didn't know it either.
- A weather advisory had been issued an hour before their departure to which the pilots were not privileged, but then Mission didn't receive the message until more than 2 hours after the pilots departed.
- It was obvious that the weather had literally exploded within 2 hours. This information was not received soon enough to have been of any use to the pilots.

Among other things, the AAB recommended faster dissemination of severe weather information by using higher precedence classification on messages and additional lines on a "hot circuit." This is being done.

There is no disputing the fact that on the basis of information received, the pilots were denied vital information concerning safety of flight. However, the pilots were in a known thunderstorm area, there were known thunderstorms along the route, and they even considered remaining at Mission. *As events unfolded they should have stayed.* A second chance was available to them, but they elected not to perform the oldest maneuver in the book – a 180.

Let's make one point, above all else, abundantly clear. Except for flights of operational necessity, there is no reason to proceed into known thunderstorms, *period*. Pilots who have "bought the farm" under these conditions are legion. Let them RIP. They do not need any more members. ◄

'I have the Runway!'

TWO A-4Ls took off on a VFR flight scheduled to be a NATOPS check for one of the pilots. The flight proceeded routinely until time to return home, at which time it became necessary to file IFR because of enroute weather. This possibility had been foreseen and prebriefed, so it caused no concern.

Nearing homefield an enroute descent was commenced by the section, followed by a GCA pickup. The pilot receiving the NATOPS check was leading. The plan was for the wingman to land on the first approach and the lead pilot to fly another GCA, then depart the area VFR for additional training in the local area.

The wingman landed; the flight leader took a missed approach and completed another GCA to a low approach. He then departed VFR.

Sometime later, after climbing to 11,000 feet, he contacted Center, requesting another radar descent and a GCA to a final at NAS Local. Center handed the *Skyhawk* off to Local Approach Control. Approach Control vectored the A-4 toward NAS Local but advised the pilot of a line of weather about 1 mile northwest of the field. Approach inquired whether the pilot wanted to divert to Nearby International Airport (which was VFR), or if he wanted to try and beat the weather to NAS.

The pilot stated he would try to outrun the weather and land at homeplate. About this time, he passed over Nearby International and noted the weather to be clear from the surface to above 11,000 feet.

Twelve miles southeast of NAS Local he was handed off to Navy GCA. GCA advised him that the weather was deteriorating, and visibility was down to 2 miles with heavy rain on final. Shortly thereafter (before the A-4 turned inbound), GCA lost all power. GCA advised the pilot of their problem and estimated that it would be 5 to 10 minutes before GCA would be operating again. Control of the A-4 was then returned to Local Approach.

Expecting GCA to be up in a few minutes, the pilot requested a vector to intercept the TACAN final approach course. Shortly after interception he received a report relayed from the tower that visibility to the west was ½ mile and worsening. The pilot replied that he would make one TACAN approach, and in the event of a missed approach, request a radar vector to Nearby International. He further advised that he would remain on Approach Control frequency to facilitate radar vectoring if it became necessary.

Approach rogered and advised that NAS Local weather was now " . . . estimated 1500 broken, visibility 1 mile, thundershowers." The pilot was then cleared to land. On final, information was relayed by NAS Tower that visibility was less than ¼ mile in heavy rain.

At 3 miles and 400 feet AGL, the pilot lost DME and azimuth, but could see the ground. He recognized a set of railroad tracks which ran parallel to the final heading and elected to continue toward the field. Approach Control called, "One mile," at which time the pilot replied, "I have the runway."

Holding 400 feet on his radar altimeter, the pilot had spotted the runway at 11 o'clock. Realizing he was high and fast, he reduced power (almost to IDLE) and nosed the aircraft over while turning to intercept the runway centerline. Approaching touchdown, he realized he had an excessive sink rate and attempted to stop it by adding power and flaring. This was insufficient to arrest the rate of descent, and as the *Skyhawk* touched down hard, drifting left, both main landing gear collapsed.

The aircraft slid down the runway, out of control, for about 3500 feet before departing the runway. It continued another 350 feet before coming to rest. There was no fire, and the pilot, with assistance from the crash crew, exited the aircraft without injury.

Why then did this pilot, a very experienced naval aviator highly regarded as a real professional, allow himself to get into such a marginal situation? The answer seems to be a number of little things.

When GCA went down, the pilot could have headed for Nearby International Airport (as was suggested by Approach Control). He chose instead to make "one pass by the TACAN." During the approach, he was informed that visibility was down to ½ mile – below minimums for a TACAN approach. However, he was already on the approach and could, therefore, legally make one pass.

Be that as it may, a missed approach was certainly in order when the pilot lost DME and azimuth at 3 miles. Even though he could see the ground and was able to recognize landmarks, *he did not have the runway environment in sight*. As he continued inbound, his attention appears to have become channeled on locating the runway. The immediate result of this was a breakdown in instrument scan which allowed an excessive buildup of approach speed.

This excess speed, 400 feet of altitude, and poor runway lineup severely complicated the landing problem when the runway came into view at about 1 mile. In retrospect, the *prudent* thing at this point would have been to execute a missed approach.

There may have been an element of get-home-itis involved in this accident since Nearby International was a suitable alternate. However, landing there would have occasioned considerable delay while special starting equipment was dispatched from the NAS.

In summary, it appears that the urge to get home without delay, coupled with a degree of overconfidence based on extensive time in model, and familiarity with the local area, combined to cause several errors in judgment. The result was a *very hard* field landing and a broken bird. ◄

Four Engines.
No Sweat!

ONE of the passengers put down his bridge hand on the table and firmly grasped the arms of his seat (white knuckles showing). Despite the pleas of his opponents, who were losing, he refused to finish playing the hand. This incident took place when a C-54 lost two engines with an inspection team of 45 members aboard. The flight was cruising at 6000 feet, in and out of heavy rain and light turbulence, inbound to Memphis. Number 3 was feathered first, and within 15 minutes No. 4 was also feathered. Now most pilots of four-engine aircraft who experience something like this will cast about for an available airport. The plane commander of this flight was no exception.

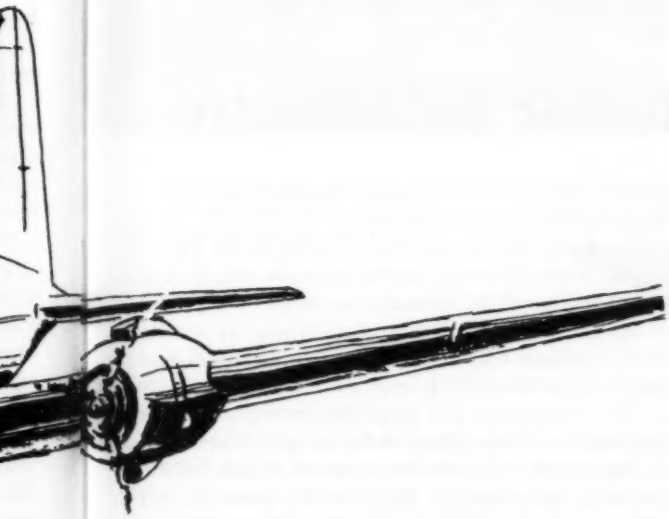
The pilot and copilot quickly agreed that Blytheville was a suitable spot since it was only a few minutes ahead of them – on a direct course. An emergency was declared and, from the friendly folks at Memphis Center, the plane commander received a clearance to Blytheville. He subsequently made a GCA and routine landing on one of those long, lovely stretches of concrete which stand out plainly against the Arkansas countryside.

In addition to the two pilots flying the aircraft, there were four other C-54 pilots aboard who were members of the inspection team and merely passengers. None of the six C-54 pilots, when reviewing the day's events later on, could remember making an actual two-engine-out landing before. The way in which the plane commander handled the emergency, particularly the landing and rollout, was professional.

(For the curious, it never was determined exactly what caused both engines to malfunction. The best guess was they had "shorted out" in the heavy rain. The next day after being thoroughly dried out, harness checked and plugs checked, both engines ran normally. After a short test flight, the C-54 was flown the remaining 35 or 40 miles to Memphis.)

Under similar circumstances, which occurred on a NATOPS check in an empty aircraft, a C-118 pilot did not fare as well.

The C-118 pilot was presented with a simulated No. 1 and No. 2 engine-out situation. He executed proper



engine-out procedures and aligned the aircraft for landing. However, shortly after touchdown both port MLG tires blew. The aircraft shuddered and shook during deceleration but, despite a tendency to swerve on rollout, directional control was maintained by the pilot with nosewheel steering and power off on all engines.

Fire and smoke broke out in the port MLG assembly but dissipated rapidly after the aircraft was stopped on the runway. Crash equipment roared up to the plane, landing gear pins were installed, and the crew abandoned the aircraft. Although unconfirmed, the possibility existed that pilot technique was a likely cause. The reduction of high asymmetrical power and the accompanying rudder trim changes require pilot finesse. It is not unlikely that the pilot inadvertently applied left brake while adding rudder to keep the plane straight.

Pilots of multiengine aircraft, to keep sharp, must periodically fly training missions to review emergency procedures. This is necessary to maintain currency in the many phases that flying the line does not permit.

Let's look at some factors and their frequency of occurrence which can be quite different on a training flight as compared to an operational mission. Consider weather, cockpit coordination, assistance by others, performance and mental attitude.

Most training flights are conducted in visual conditions so that many approaches, bounce drills and simulated emergencies can be performed without the delays that instrument conditions automatically necessitate. Perhaps a false sense of well-being results when the weather is hot and dusty. Most pilots do not attempt to fly as precisely in visual conditions as they do on the gages.

There is generally less cockpit coordination when performing training evolutions. Usually one pilot is acting as big brother while the other practices or is being checked. Under such circumstances, the ordinary pilot frequently tries to accomplish too much – instead of sharing cockpit duties.

Generally, little thought is given to requesting assistance from others when emergencies are simulated on a training flight. There is a tendency by some to compound an emergency, or delay asking for help when discretion dictates the opposite. It makes sense if you're shooting lazy eights around Homeplate's "maypole" and you simulate engine(s)-out, that you advise the tower *just in case* the simulation becomes the real thing.

A casual attitude frequently causes performance degradation because one is not as sharp as he might be, or would be, with a load of passengers. Then too, there's always the thought that nothing is really wrong, and if you get in a bind you can cancel the simulation and fly it out. This is fine if the bind is recognized soon enough and the pilot is not too proud to admit a momentary goof.

The obvious benefits to be gained by introducing emergencies and practicing them are twofold. The element of indecision or uncertainty is eliminated when the real emergency occurs, and you ensure that proper procedures are known and followed automatically by constant practice.

Aviators on training flights might do well to follow the example of professional golfers or bowlers who, when they practice, mentally simulate a competitive situation. Professional pilots can learn much from other types of professionals. The mere repetition of landing after landing is not without some benefit, but perhaps it would be more beneficial to practice crosswind and downwind landings – assuming that winds, traffic and runway conditions will permit it.

In summary, it is suggested that each training flight be considered by the pilots in the same way as an operational mission. Each evolution and maneuver, when performed as if max-load existed, adds a degree of realism. Realism in turn causes a pilot to concentrate on the job at hand, enhances precision and usually results are "as expected." A little sweat in a training situation may eliminate the big sweat when the chips are down.

Questions that are being asked today are:

- Is the cost of quality worth the price?
- Do the Naval Air Rework Facilities produce faster and with greater vigor just to meet a schedule?
- Are they producing a reliable quality product?
- *Is the customer being satisfied?*

Have you asked yourself these questions lately? NAVAIRSYSCOMREPLANT did – and the conclusion is

HAPPINESS is Customer Satisfaction

THE NAVAIRSYSCOMREPLANT has implemented a program at East Coast NARFs known as the REP (Rework Excellence Program), which results in a CSI (Customer Satisfaction Index).

One of the East Coast Naval Air Rework Facilities has just completed repair of an aircraft. It gleams in the sun from a fresh coat of paint. All systems have been refurbished. Sitting there "brand new," it indicates a readiness to serve the Fleet.

The ferry pilot picks up the aircraft, delivers it to a squadron, whereupon, the squadron performs an acceptance inspection and submits an ADR (Aircraft Discrepancy Report), OPNAV Form 4790/48, to the parent rework facility. If the bird is in good shape and no discrepancies exist, the word "NONE" is submitted. Should discrepancies exist, they are listed on the ADR.

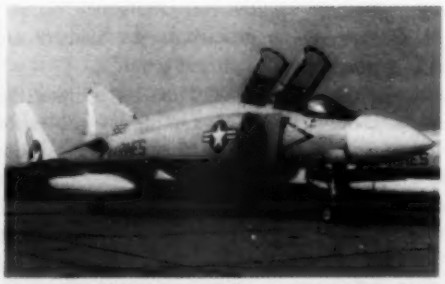
The reports are then utilized for compiling the Customer Satisfaction Index. The CSI from each NARF is submitted to the NAVAIRSYSCOMREPLANT for 13 periods each calendar year and is monitored and verified by the quality assurance managers.

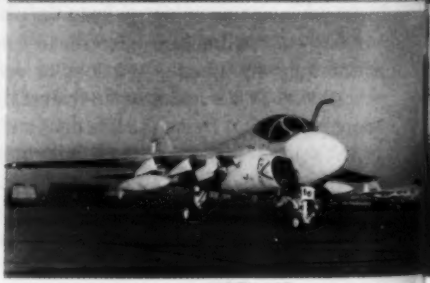
The Naval Air Rework Facility attaining the highest degree of aircraft rework excellence for the last calendar year (1971) will be awarded the Naval Air Systems Command Representative, Atlantic trophy by RADM K. C. Childers, USN. The presentation will take place some time in March 1972.

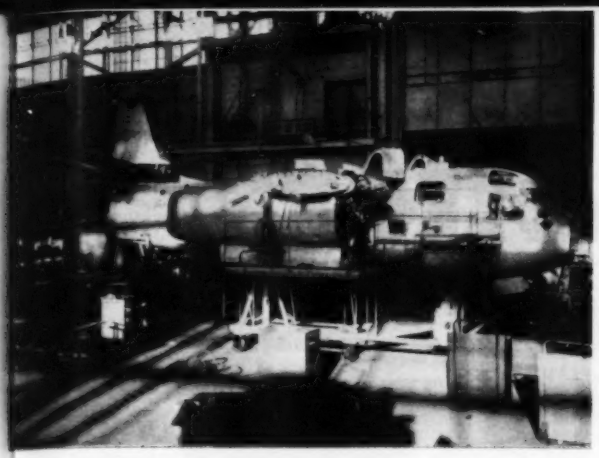
The comparisons and judgments in this award are based on the ADRs submitted depicting the Fleet's view of the quality of products produced by the NARF. Schedule, cost, quality, utilization of resources, and communications between the Naval Air Rework Facilities and their customers, are other items to be considered for the award.

This program has many advantages:

1. Informs the NARF CO concerning the degree of customer satisfaction with aircraft reworked at his NARF.







THIS TROPHY IS AWARDED ANNUALLY TO THE ATLANTIC AREA NAVAL AIR REWORK FACILITY ATTAINING THE HIGHEST DEGREE OF AIRCRAFT REWORK EXCELLENCE. IT IS BASED ON A CUSTOMER SATISFACTION INDEX ALONG WITH OTHER CONSIDERATIONS SUCH AS SCHEDULES, COST, QUALITY, UTILIZATION OF RESOURCES, AND COMMUNICATIONS BETWEEN THE NAVAL AIR REWORK FACILITY AND ITS CUSTOMERS.

RADM K. C. Childers, USN
Naval Air Systems Command
Representative, Atlantic

By G. P. McMillan
Quality Assurance Office
NAVAIRSYSCOMREPLANT

2. Motivates communications between the NARF and the squadron (i.e., familiarize squadron personnel with PAR requirements).

3. Discourages initiation of discrepancies originated by the squadron that are not within the PAR concept.

4. Encourages PAR liaison visits with the squadron.

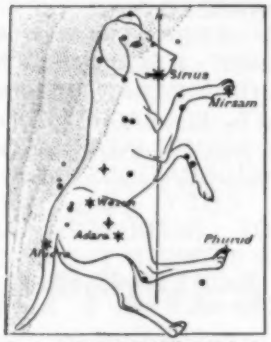
5. Effects the proper corrective action.

6. Improves quality and reliability of aircraft.

7. Provides uniform procedures and eliminates discrepancies that are not the responsibility of the NARF.

The result –

HAPPINESS Is Customer Satisfaction



The Constellation Canis Major, according to ancient descriptions and figures.

Letters

The only way to make a man trustworthy is to trust him;
and the surest way to make him untrustworthy
is to distrust him and show your distrust.
Henry Lewis Stimson

Meeting the Schedule

NAS Norfolk – I would like to comment on the age-old problem of quality maintenance versus flight operations.

There is little doubt that flight crew training is vital if the mission of a squadron is expected to be met. Due to highly sophisticated aircraft in today's inventory, extensive flight time is needed to properly train, qualify and maintain flight crew personnel in a high state of mission readiness. Due to these requirements, maintenance departments at times receive some rather demanding pressures to assure that aircraft are made available to meet the published flight schedule. On the other hand, down time is also required for the performance of quality maintenance if aircraft are to be expected to perform the functions necessary for successful completion of missions assigned.

In order to meet inspection requirements, periodic checks, incorporate aircraft service changes, correct known discrepancies (some of which are repeats and may need extensive troubleshooting), etc., aircraft must be made available to maintenance departments.

Where do you draw the line between time for flight operations and time for necessary maintenance functions? There is no cut and dried answer. Quality maintenance is the result of attention to proper procedures and guidelines, followed by quality assurance inspections to ensure accuracy and completeness of maintenance tasks carried out. All of this is required in order to provide mission ready aircraft for the flight schedule.

The article "Supervision," which appeared in the June 1971 APPROACH, stated that supervision in the area of aircraft maintenance was a substantial factor in FY-70 accidents. It then presented several examples, e.g., excessive delay in providing or incorporating aircraft service changes, inadequate quality assurance inspections, allowing aircraft to operate without correction of known discrepancies (some repeats), and improper preflights. In all probability, an unstated contributing cause factor was the demand to meet the flight schedule. All these examples and factors have a hand in the causes which contribute to maintenance errors.

I would like to recommend the training films "Safety is Your Business" (MN-10003A) and "The Big Payoff" (MN-10003B) to all activities. The theme of these films is applicable to all hands and brings out what is the overall problem to maintenance errors – *Attitude.* You can't see, feel, smell, or taste it, but *it's* there. The attitude of every man in an activity who realizes that the aircraft flying overhead is there because he did his job right the first time, is the *right attitude* to have.

AZC R. J. Morris, USN
NAMTD 3021

● Every activity requires talented and experienced personnel to carry out its mission, but without that special ingredient of *proper attitude,* all their efforts could be for naught. Attitude is a very important factor and, fortunately, it is one factor over which good supervision can have the most influence. Good supervision normally results in good attitude. The training films you recommend clarify, for both the worker and the supervisor, what the term "proper attitude" stands for and point out numerous means by which it can be achieved. We feel many activities will now be requesting these films for viewing by all hands. Thank you for providing new angles to consider in the continuing effort to decrease the accident rate.

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request.

Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, Va. 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

Parachute Risers and LPA-1

FPO, San Francisco – In the August 1971 APPROACH, a short article appeared stating that proper procedure is to place the parachute risers on the outside of the LPA-1 collar ("Risers and LPA-1," page 31). Most of our pilots do just the opposite. In a readyroom experiment we suspended a pilot by risers attached to the overhead. Using an inflated LPA-1, we found that head position was better and accessibility of the koch fittings was just as good with the straps on the inside of the collar. Also, on a recent ejection, a squadron pilot (with his risers on the inside) inflated his LPA-1 on descent and experienced no difficulty in any way, including getting away from his chute once he was in the water. The B/N, who had his risers on the outside, inflated his LPA-1 *after* water entry.

Unfortunately the movie, "Aircrewman's Life Preserver – Type LPA-1" KN-11093, mentioned in the

article, is not aboard. My questions are: Why place the risers on the outside? Why not on the inside?

LTJG J. S. Hottenstein
CVAN-65, VA-196

● "Inside or outside" has been the subject of considerable discussion and testing. Initially, development tests of the LPA-1 at NAVAIRDEVCEN (Naval Air Development Center) showed that when the parachute riser lines were routed inside the collar lobe during hookup to the parachute disconnect fittings, 1) dry wear comfort was unfavorably affected, 2) visibility of the parachute disconnect fittings during parachute descent was not enhanced, 3) accessibility of disconnect fittings after water contact was reduced and 4) potential danger of facial injury and preserver damage at time of parachute release was increased. It was further reported that some trade-off in the survivor's mobility and his ability to see was made in order to maximize the preserver's flotation performance.

When complaints came in from the Fleet that the collar lobe interfered with frontward vision and restricted head and upper torso mobility, NAVAIRDEVCEN devised an alternate SV-2/LPA-1 hookup to improve the inside routing configuration and then reevaluated the system. Although static tests at NAVAIRDEVCEN indicated that inside routing in this configuration appeared promising, results of dynamic tests at NAVAERORECOVFAC (Naval Aerospace Recovery Facility) showed that no significant improvement was achieved by this routing and it recommended that no change be made. Accordingly, the prescribed method for routing the parachute risers continues to be outside the LPA-1 collar. This information will appear in a change to the Aviation Crew Systems Manual (Inflatables), NAVAIR 13-1-6.1.

As for the training film, NAVAIRDEVCEN states that the film was distributed throughout the Fleet on 5 March 1971. NAVAIRDEVCEN further advises that the matter of restricted mobility and vision is being considered in development of a new design life preserver/survival vest.

Lunch Box Feedback

NAS Norfolk – In your September issue, "Letters" section, there is an item about the possible use of a styrofoam container or styrofoam liner to keep box lunches cold. You state that this makes good sense to you. At first thought, it made good sense to me, too, but after a little extra thought, I remembered a notice in our station Plan of the Day stating that styrofoam is considered a fire hazard. We, in aviation, know what fire in an aircraft means.

I suggest this item be carefully researched before putting styrofoam containers in aircraft as I feel the fire hazard outweighs any cooling merits the items might have.

As an alternate, might I suggest a standard type chest cooler?

AC-1 Loren A. Carroll

● Rest assured that the use of styrofoam will be thoroughly investigated before any decision is made to use such boxes for lunches aboard aircraft. With the concurrence of the Bureau of Medicine and Surgery, NSO (Navy Subsistence Office) has requested the U.S. Army Natick Laboratories to conduct a technical review to determine the characteristics and suitability of a styrofoam material as packaging for inflight box lunches. The Natick Laboratories is the command responsible for accomplishing the DOD food research, development, test and evaluation program. Any future course of action will be determined on the basis of this review.

NSO is of the opinion, however, that the food-borne illness related in the *Weekly Summary* (23-29 May 1971), which began this discussion, was probably not due to the uncontrolled time/temperature factors following issue of the box lunch.

"If handled properly in the galley prior to issue, chicken should not be dangerous to eat only 2 hours and 45 minutes after being removed from refrigeration," NSO states. "In view of the presented facts, for the subject chicken to cause food-borne illness, it must have been highly contaminated at the time the lunch was issued. If, during the preparation and holding of box lunches, the sanitary precautions outlined in applicable BUMED and NAVSUP publications are strictly adhered to, outbreaks of food-borne illness should not occur." ◄

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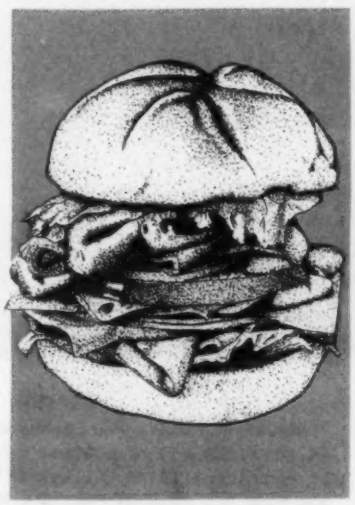

Vol. 17 **approach** No. 8

RADM W. S. Nelson
Commander, Naval Safety Center

Our product is safety, our process is education and our profit is measured in the preservation of lives and equipment and increased mission readiness.

Contents

1 Is the Aircraft REALLY Ready for Flight?
8 Hushians, SST and Bugs
10 The AH-1J *Seacobra*
16 NCLT A Complete Approach
By LCDR J. R. McDaniel
23 Bravo Zulu!
24 Crash
30 Cruise Clearances
32 The Overdue Hummer
By CWO P. W. Meyn
36 Don't Apologize for Safety
By LCOL Oliver A. Lazare, USAF
38 Out but not Back
40 'I Have the Runway!'
42 Four Engines. No Sweat!
44 HAPPINESS is Customer Satisfaction
48 By G. P. Millan
IBC From My Point of View

Departments

6 Short Snorts
14 Anymouse
34 Notes From Your Flight Surgeon
46 Letters

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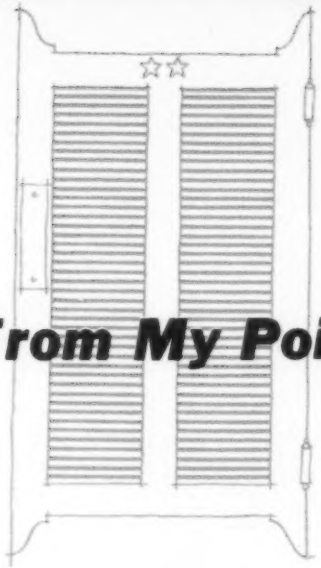
Credits

This month's cover painting by Blake Rader is of the Marines' new AH-1J *Seacobra*. An article on the *Seacobra* begins on page 10. Photos on p. 10, 11 CPL Lyle C. Smith H&HS MCAS(H) New River, N.C. *Corsair II* photo on p. 30 by Floyd Sykes.



From My Point of View

Our Peripatetic AAIs

If you meet NAVSAFECEN's Commander Dan Daily or any of his 10 assistants outside the Norfolk area, chances are that it will be under pretty traumatic circumstances.

Dan is head of our Aircraft Accident Investigation Division. He and all his gang are real pros at their specialty, having had extensive formal training and up to six months OJT before "solo." One is a civilian (ex-Marine); the remainder are active duty naval and Marine aviators.

Normally, at any given time, from one to three investigators are "on the road." They rotate the duty, carrying portable *beepers* through which our Center Duty Officer can call them to the phone 24 hours a day. In addition, they keep a bag packed so as to be able to be on their way to any crash site within an hour and a half after we get the word.

Once on the scene, our AAI provides assistance to the Accident Board, provides guidance to the maintenance facility assisting in DIR or metallurgical analysis, and provides me with an independent, abbreviated report. This report is used internally unless the facts disclose a material or supervisory situation requiring immediate action. (Accompanying photo shows LCDR Cataldo describing an A-6 material failure while CDR Daily looks on.)

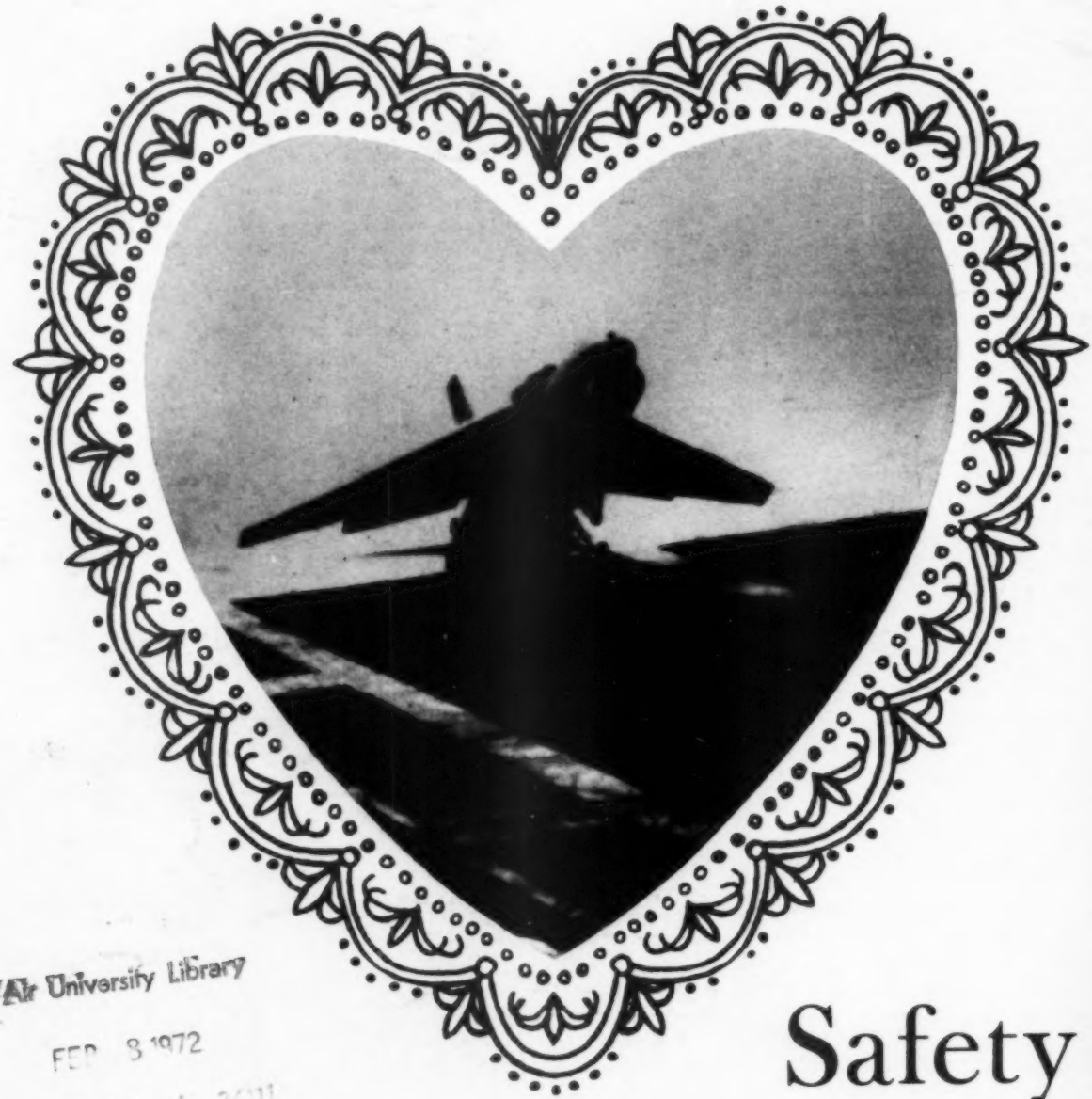
As a general rule, NAVSAFECEN investigates only those aircraft accidents meeting the following criteria:

- Catastrophic aircraft destruction and wreckage distribution beyond reasonable investigative capability of the local accident board.
- Special interest stemming from trend detection or involving new type aircraft.
- High public or government interest in an individual mishap.

Of the 505 accidents which met one or more of these criteria during the last 4 years, 344 were investigated by Naval Safety Center investigators. Positive cause factor findings were made in *80 percent* of the cases. Our goal is to investigate and develop positive cause factor findings in *100 percent* of those accidents which warrant professional investigation.

Naval Safety Center investigators are unanimous in describing their duties as personally fulfilling and rewarding. As one of Dan's best sleuths recently remarked, "I know of no accomplishment more rewarding than ferreting out and eliminating a condition which might otherwise cost someone his life."

W. S. NELSON



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Safety is never having to say you're sorry!